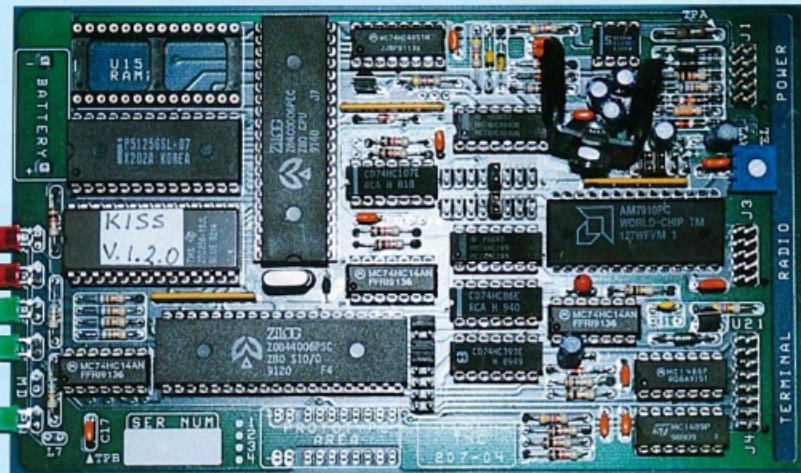


AMATEUR RADIO

APRIL 1993
Volume 61 No 4



Journal of the Wireless Institute of Australia



- Build a simple, metered dummy load
- Equipment Review — PacComm Pactor Controller
- Crossing the Tasman on long wave

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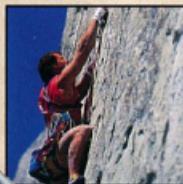
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Cover

PC Board components of the PAD207 Packet Controller. The controller is available as a kit at a reasonable cost. Details of the controller's operation were described in AR last month (March 1993) by Colin MacKinnon, "Build a Packet TNC" on page 14.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Being a Good Neighbour

What does this expression conjure up for you? For some it's a nature strip of old car bodies with grass protruding from them. For others it's a back yard surrounded by a high fence containing, at least some of the time, savage dogs. But are we radio amateurs pure and blame-free? Are our antennas structurally sound, approved if necessary, and would our insurance pay up if the 20-year-storm takes them into the neighbour's living room? Would our shack wiring pass the Standards Australia code? Are our emissions spectrally pure with only enough power used to make the contact, low pass filters included in HF coaxes and antennas tuned to the operating frequency?

Speaking of linear, AOCP power limits are 400 W pep; however, a recent survey of linear available in Australia showed very few available with that rating. The most common was 1.2kW with some up to 2kW; three to five times the limit. It would be naive to think all of these are meticulously adjusted to 400 W pep. How natural the temptation must be to up the output as the sunspot number falls.

In living with our neighbours we will all be faced at one time or another with the problem of RF interference. Once we have proved our equipment is clear — that is, working within specification — we may feel better. If the neighbour's TV is a cheap import, fitted only with rabbit's ears, DoTC will generally support us. But, what if that TV has passed a stringent type standard as applies, say, for sets of German origin. Both sides are "right", but the interference persists! Now the laws of nuisance apply; the neighbour has as much right to receive clear TV as the amateur has to pursue his hobby. There is only one real solution — negotiation. Any other can be both costly and very anti-social.

The WIA implores radio amateurs to work out their interference problems in a calm and methodical way, because one incident of pig-headedness and the growing aggravation that follows, many times right up to the Minister, can only harm irreparably our enjoyment of our hobby.

Ron Henderson VK1RH, Federal President

ar

PUBLISHERS COMMENT

Comments are continually received about the content and presentation of Amateur Radio magazine. Several changes have been made to this issue in response to this feedback. What do you think?

Bill Roper VK3ARZ

ar

AN RF POWER METER LOAD

(With notes on PEP)

Drew Diamond VK3XU* describes the measurement of radio frequency power and other transmission tests.

The transmitter output should ideally be terminated with a non-radiating dummy load of resistive impedance, usually 50 ohms, into which the power amplifier is designed to work. Here is a simple metered

load suited to medium power applications. An optional -40 dB attenuated output and headphone jack are also provided. Parts are available locally.

RF Power Meter Characteristics

Nominal Impedance: 50 ohms +6% -12%.

SWR: Less than 1.14 from 1.5 to 30 MHz.

Power Capacity: 50 W for 5 minutes, 110 W at 50% duty cycle (determined empirically. More accurate data available from the load resistor supplier).

Attenuation: -40 dB.

Circuit

Power (in our case electrical power) is defined as "the rate of doing work". Under dummy load conditions, almost all of the electro-magnetic energy conducted to the load is converted into heat energy, so work is done in heating the resistor element, the case housing, the resistor, and the surrounding air. 110 W is a lot of power to have to dissipate in a smallish space, so the load must have adequate capacity, at least in the short term, thereby allowing sufficient time to make the required measurement.

At the 110 W CW power level, the peak voltage is just over 100 V, and half-wave rectification will double this value. The PIV rating of a small signal diode of the 1N4148 variety would therefore be exceeded (ordinary power diodes are too slow for use at

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers	Weekly News Broadcasts	1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Christopher Davis VK1DO Secretary Jan Burrell VK1BR Treasurer Ken Ray VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) \$70.00 (G) (\$S) \$56.00 (X) \$42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Terry Ryeland VK2UX Secretary Bob Lloyd Jones VK2YEL Treasurer Bob Taylor VK2AOE (Office hours Mon-Fri 11.00-14.00 Wed 1900-2100)	From VK2WI 1.845, 3.595, 7.145*, 10.125, 24.950, 28.320, 52.120, 52.525, 144.120, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10m, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) \$66.75 (G) (\$S) \$53.40 (X) \$38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Jim Linton VK3PC Secretary Barry Wilton VK3XV Treasurer Rob Halley VK3XLV Office hours Tue & Thur 0830-1530	1.840MHz 3.615SSB, 7.085SSB, 53.900FM(R) Mt Dandenong, (F) 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macdonald, 438.075 FM(R) Mt St Leonards 1030 hrs on Sunday.	\$72.00 (G) (\$S) \$58.00 (X) \$44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President John Aersse VK4QA Secretary Ken Ayers VK4KD Treasurer David Travis VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz, 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$70.00 (G) (\$S) \$56.00 (X) \$42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Bob Allan VK5BJA Secretary Maurie Hooper VK5EA Treasurer Bill Wardrop VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, (F) 146.900 FM(R) South East, ATTV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) \$70.00 (G) (\$S) \$56.00 (X) \$42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 344 5241	President Cliff Bastin VK6LZ Secretary Anthony Lumley VK6ZTL Treasurer Bruce Hedland-Thomas VK6OO	148.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) \$60.75 (G) (\$S) \$48.60 (X) \$32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015	President Tom Allen VK7AL Secretary Ted Beard VK7EB Treasurer Peter King VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$67.00 (G) (\$S) \$53.65 (X) \$39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz.)		Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three-year membership available to Australian resident (F) (G) (X) grades at fee x 3 times.

Note: All times are local. All frequencies MHz.

RF). A resistive voltage divider samples a fixed portion of the applied voltage. At 110 W, the rms voltage will be about 74 Vac, so 5 Vac will be established across the 330 ohm resistor, being a more appropriate voltage for the diode, and without significantly loading the 50 ohm resistance.

The dc voltage developed across the 0.047 μ F capacitor drives the 1 mA meter, which is calibrated in terms of power in 50 ohms.

In order to make oscilloscope, spectrum analysis, or frequency counter measurements, a -40 dB output is made available at a rear mounted connector.

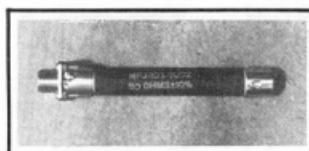
The signal may also be crudely monitored by listening with high impedance headphones at the monitor jack. Clean SSB should sound like "duck talk", without clicks or pops. Keyed CW should be a soft "foomp foomp" sound, again without clicks, pops, noise or whistles (but with perhaps just a trace of hum). AM is detected directly. The meter is disconnected when the "phones" are plugged in.

Construction

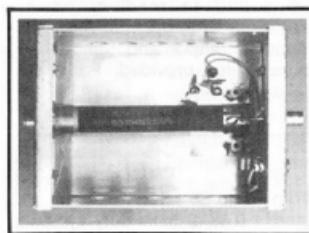
To prevent any signal from being radiated, the load resistor must be housed in a metal case. Above about 50 W the heat generated is considerable. To avoid "melt-down" of the meter, it should be isolated and screened from the load. Shown is a suggested approach. My home-made case measures 115 mmW \times 220 mmH \times 155 mmD. Holes in the sides and bottom of the load compartment allow convection cooling of the resistor.

The load resistor is a plain metallised ceramic tube type, made by MFJ, part number MFJ-103-9002, and is supplied without connection lugs. Constructors with lathe skills may wish to turn brass tube ferrules to fit snugly over the metallised ends. Good electrical and mechanical contact is obtained by slitting the ferrules one cut lengthwise with a hacksaw. Or ordinary tin-plate (cut from a jam tin) may be formed and soldered to make friction-fitting end connections.

The centre coax pin is connected by a length of stout copper wire



Load resistor with end ferrules.



Load resistor compartment.

insulated with ceramic or glass beads (necessary because the inside of the tube is conductive and also gets rather hot) passed down the centre of the ceramic tube and soldered to the end cap ferrule. That done, temporarily fit the four coax mounting screws with brass nuts. You should find that 3 mm or 1/8" Whit nuts fit nicely around the perimeter. The nuts are then soldered at their correct positions. The four screws can be removed and replaced later when the resistor is installed into the case.

Mechanical support for the live end of the resistor is recommended, and a suggested method is shown, where a rectangle of bakelite has been bored to take the end cap.

The power dissipated by the 2400 ohm resistor is about 2 W at the 110 W level. However, above about 50 W,

power must only be applied in short bursts, so we can get away with a more easily obtainable 1 W resistor here.

To reduce the possibility of power being accidentally applied at the wrong end, consider making the attenuated connector a type different from the input, and fixed to the back panel as an extra precaution. If the headphone and attenuator options are not required, simply omit the associated components.

Calibration

There are three empirical methods of calibrating the meter; firstly, by substitution with a known accurate power meter — self explanatory. Secondly, by the use of an appropriate thermocouple RF ammeter, described below. Thirdly, by RF voltage measurement, described in Refs (4) and (5).

For the practical purposes of the following, in a purely resistive load (that is, a real resistor without significant reactive component at the frequency of interest), measured DC resistance and RF impedance may be assumed to be the same value. With a multimeter check the resistance of your completed load. It should read between 44 and 53 ohms, which limits represent an SWR of 1.14 and 1.06 respectively. In practice you should find it to be nearer 50 ohms.

If you do not own an RF ammeter, one of the members of your radio club may have one of perhaps 1.5, 2.0 or 2.5 A sensitivity. For best results, the meter should be housed in a metal

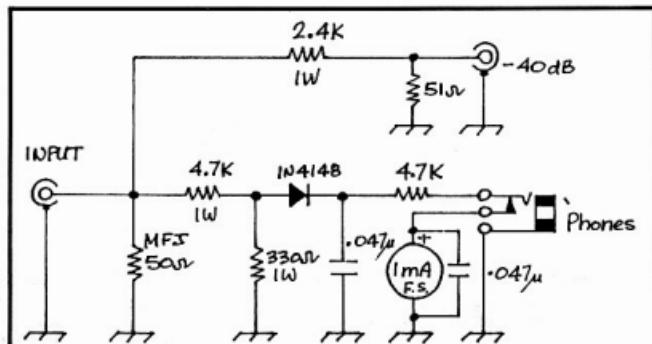
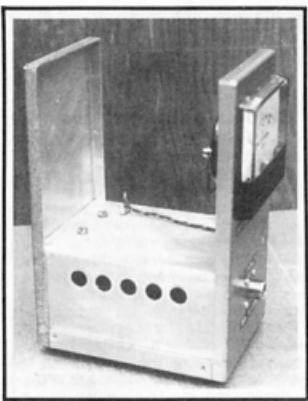


Figure 1 Circuit of RF Power Meter Load



Suggested construction method.

box with coax connectors to suit. Connect the ammeter between your transmitter and power meter, with a short coax (or adaptor) between the ammeter and load. Apply power in the CW mode. For a continuous sine wave;

$$\text{Mean Power in Watts} = I^2R$$



RF Power meter load.

where I is the current in amps, and R is the pure resistance in ohms. However, we want to know the current required to produce a certain power level, so by transposing:

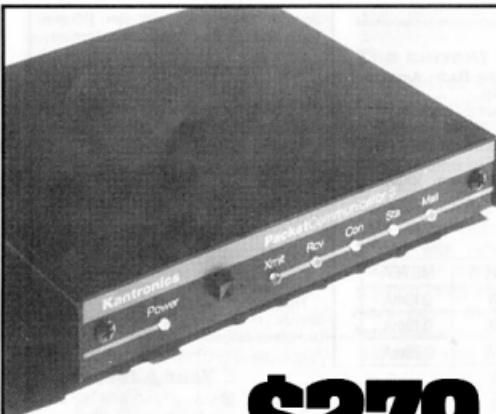
$$I = \sqrt{(P+R)}$$

For example, at 100 W the current will be $\sqrt{(100+50)} = \sqrt{2} = 1.41$ A.

Calculate and measure for as many calibration points as required between about 5 W and 110 W. Space exists for a good estimate of the legal 120 W calibration point if desired. Be mindful of any duty cycle limitations on the transmitter's output amplifier. Worked out on a calculator, some values will have more decimal places than can be read on an ordinary meter, so rounding-off to the nearest 0.01 A will generally be necessary. Table 1 may be used as a guide where the load is 50 ohms. The meter reading shown will probably provide adequate accuracy if you cannot calibrate by the above methods.

PEP Notes

The Peak Envelope Power of an SSB signal may be measured by observing a "two-equal-amplitude-tone" waveform on an oscilloscope connected via coax to the attenuated output. The "scope" end of the cable should be terminated in 50 ohms. The linear capacity of the output amplifier shall not be exceeded (ie, there must be no flat-topping or clipping of the



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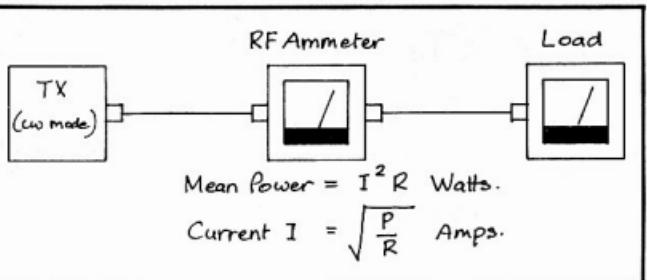


Figure 2 Calibration Set-up for Mean Power.

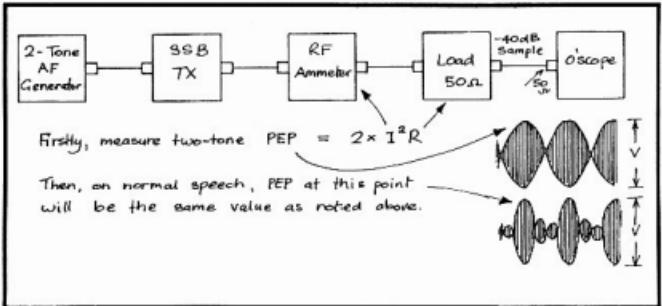


Figure 3 Set-up for measuring PEP.

RF waveform). Read the current I indicated on the RF ammeter.

$$PEP = 2(I^2 R)$$

For example, if the current is 1.41 A, then $2(1.41 \times 1.41 \times 50) = 200$ Watts PEP. Now, under actual speech conditions, waveform peaks which attain the measured two-tone amplitude will have a PEP of that value. Naturally, the "scope" must have sufficient bandwidth for the frequency in use. See Ref (1) for a suitable two-tone generator circuit, and Ref (5) for a fuller discussion on RF power measurement.

Parts

The only special component is the 50 ohm non-inductive load resistor. These may be ordered from Stewart Electronics, ph. (03) 543 3733. Cost is about \$30. A larger power resistor unit is available if required. The remaining components should also be obtainable from other electronics suppliers.

References

1. Test Equipment for the Radio Amateur-Gibson, G2BUP, RSGB.
2. VHF/UHF Manual-Jessop, RSGB.
3. Radio Handbook-Or, Sams.
4. An RF Power Meter-Brett, G6EBR, Prac. Wireless August '84.
5. SWR/Power Meter- Hepburn, VK3AFQ, Ham Radio (USA) June '83.

Table 1

CURRENT	POWER	METER
0.32A	5W	0.13mA
0.45A	10W	0.19mA
0.63A	20W	0.28mA
0.77A	30W	0.37mA
0.89A	40W	0.43mA
1.00A	50W	0.49mA
1.10A	60W	0.56mA
1.18A	70W	0.61mA
1.26A	80W	0.66mA
1.34A	90W	0.72mA
1.41A	100W	0.77mA
1.48A	110W	0.81mA

"Nar Meian" Garters Road, Wonga Park, 3115.

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WIA News

"Golden Antenna" Award

Each year, on the occasion of the German-Dutch Radio Amateur Festival (DNAT), the town of Bad Bentheim (pronounced "bard bent-hime") awards the "Golden Antenna" to radio amateurs nominated for an exceptional humanitarian deed in the field of amateur radio.

The 12th award of the Golden Antenna will take place on 27 August this year. The jury judging nominations comprises the Mayor or Bad Bentheim, the Patron of the Festival, the President of the International Amateur Radio Union (IARU) Region I, and the presidents of the amateur radio societies VERON, VRZA, DARC and VFDB.

Nominations should cover the period between 1 September 1992 and 31 April 1993. Individuals as well as groups may be nominated, who, in emergency situations, rendered their services to other people self-sacrificingly in connection with rescue operations on the occasion of disasters, catastrophes or military conflicts.

The only thing that counts is that "the radio amateur broadcasting has played an important part in the rendering of the humanitarian deed."

Proposals, supported by detailed documents substantiating the nomination, must reach the organisers by 15 May 1993. Send to: Stadt Bad Bentheim, PO Box 1452, D 4444 Bad Bentheim, Germany.

The town of Bad Bentheim will invite the award winner to the Festival, defraying the costs for travel and accommodation.

ARRL Stands Pat

The ARRL has abandoned further consideration of a name change, put forward last year. That proposal suggested the League change to the "American Amateur Radio League".

In January the ARRL's Board resolved to continue support for Morse Code proficiency below 30 MHz, as presently required under ITU regulations.

They cited the code's longevity as a license requirement and its ability to overcome language barriers.

Changed Your Address, Callsign?

If you've changed your address and/or callsign, when you notify the WIA Federal Office would you please provide your previous address and/or callsign along with your new details.

While the computer program is good, it can't read minds, nor can Federal Office staff!

Now is a good time to check your listing in the Call Book. Advise any amendments to staff now rather than waiting till the closing date for changes which comes up in a couple of months time.

THE DAY WE CROSSED THE TASMAN ON LONG WAVE

John Adcock VK3ACA * is one of Australia's few experimenters on Long Wave, and he now describes his latest accomplishment.

It began with several people obtaining experimental licences to operate on "low frequency" (below the broadcast band). Probably the idea started before then with a number of amateurs in America using an unlicensed (CB) allocation between 150 and 190kHz with very low power. During call-backs after recent test transmissions several people have asked "what is the background for the activity?" Well, the best thing to do is read the several past articles on the subject which fully describe the origins (refs 1, 2, 3 and 5) as well as many articles in overseas amateur magazines.

I first obtained the experimental licence in 1980, but have been very inactive on LF at times, with several years of inactivity. Originally the licences were issued to myself VK3ACA and Peter VK3QI with the callsigns AX3T35 and AX3T36. At that time Peter was in Swan Hill and two-way contacts were carried out between Oak Park and Swan Hill. Later Dennis VK3WV also obtained an experimental licence with the callsign VL3Y in Springvale. Two-way contacts were also made between Oak Park and Springvale. This was in addition to many test transmissions for which reports were received from interested listeners.

The previous regular series of propagation tests was carried out as long ago as 1984. In these tests only CW was used by the author, although some others have tried SSB. During propagation tests the interest of listeners in reporting has been excellent. During these tests the author used a back-yard antenna with probably less than 100 watts to the antenna and a radiated power of about 0.2 watts. The rig is fully described in a previous article, "Experimental Stations on 196kHz" (ref 2). During the operating period using this back-yard rig the signal was heard all over Victoria, Adelaide,

Hobart and parts of NSW in daylight, and as far away as Brisbane at night.

I have known Don VK3BDJ for some time and known of his interest in this activity. Several years ago Don constructed a tall vertical antenna at his country property at Gordon near Ballarat, chiefly for 160m operation. Having achieved about as much as possible experimentally from my back yard, it was a case of let the licence lapse or try something more. I asked Don if he would like to set up the station at his Gordon property and he was agreeable.

"What is still our best DX, Perth at night."

The current test series

The first series of tests was carried out on Sunday of the Queen's Birthday weekend on 6 June 1992. The tests were carried out for 15 minutes after each hour from 12 noon to 8pm, 0200 to 1000z with a callback conducted on 40 or 80 metres after each transmission. The test period was extended to 1100z for listeners in the west. We were late in starting, with several problems, but were going in time for the 0300z transmission.

During this test several loading coils (helices) were tried, including the original used at the author's QTH (ref 2). The coil was mounted at the base of the mast and, of necessity, in the open. In this case we could obtain only just over 2.3 amps aerial current. To make matters worse, it rained. We had a plastic garbage can in which we intended to place the coil, but unfortunately we had no time to make changes, so we just had to make the best of things.

Despite the difficulties the exercise was reasonably successful. Reports

were received from Adelaide, Tasmania and all over Victoria during daylight and, what is still our best DX, Perth at night. VK6ABL received the signal about R3 at 1000z and about R2 at 1100z (8.00 and 9.00pm local time). Unfortunately we did not capture ZL, although ZL3PN thought he heard us. I thought we could do better.

Several changes were made for the next tests. The top loading was increased and a counterpoise was made for the antenna (described below). We used a solid state transmitter, although this may not have increased the power much. We used a new loading coil mounted inside a plastic garbage bin (naturally, according to Murphy's law, it didn't rain). We had better coupling to the coil, but I am still not sure if coupling was optimum.

The tests were carried out on Sunday 13 September 1992 as above, but only from 4pm to 8pm local time, that is 0600 to 1000z. Unfortunately, due to limited time, we could not extend the time to suit the west. The results were more than satisfactory. As usual the signal was heard in South Australia, Tasmania and all over Victoria during daylight.

At 6.15pm ZL3PN in Timaru reported he copied AX3T35 weakly for the 0800z test. For the 0900z test ZL3PN and ZL4MD in Cromwell reported good copy, and for the 1000z test both stations reported QSB, but the signal was copied by ZL2CA. Atmospheric noise was fairly bad, with poor copy on the 80m callback.

At the same time the test signal was copied by Austin VK2DPS at Bingara in northern NSW at 0800 and 0900z; VK4EKA at 0900 and 1000z; VK4GDR at 0900 and 1000z; and VK4ZAA at 1000z.

VK3BDJ antenna at Gordon

Don's antenna is built in typical broadcast antenna style consisting of a triangular steel lattice galvanised mast 109ft or 33m high standing on a base insulator. It is guyed with three sets of guy wires radiating out in three directions at 120 degrees around the mast, with eight levels of guys vertically. A photograph of the basic antenna is shown in fig 1. The guys are broken up into several insulated sections.



Fig 1. Antenna from below.

To improve the loading and capacitance of the antenna on 196kHz an extra vertical steel pole 16ft or 5m was added to the top, to which a top load of radial wires around 50ft or 15m long was also added. In the final form prior to the last test, 20 top load radials were used.

Also, to improve the loading, a counterpoise was constructed at the base of the antenna which consisted of a hexagon of wire with six radial spokes with each span about 16m long. The counterpoise was suspended from eight poles about 3m high, and insulated with stick porcelain insulators. The construction is shown diagrammatically in Fig 2.

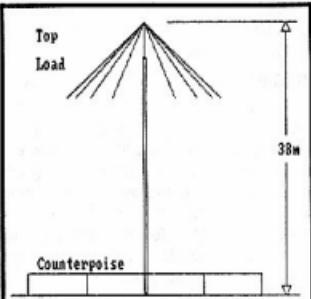


Fig 2. Outline diagram of antenna set up guy wires not shown.

The loading coil used for the September tests was new and wound by Don with flat strip copper with the short edge against the coil former. The former was a piece of 300mm diameter PVC pipe wound with 56 turns. The earth was tapped up 15 turns from the bottom. Fine tuning was achieved with a rotating single turn at the top (variometer). The counterpoise was tapped onto the bottom turn. The coil was coupled to the transmitter with a two-turn link. See Figs 3, 4 and 5.

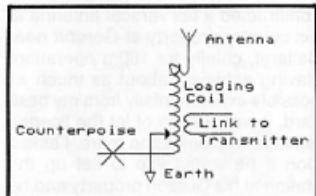


Fig 3. Schematic of antenna loading circuit.

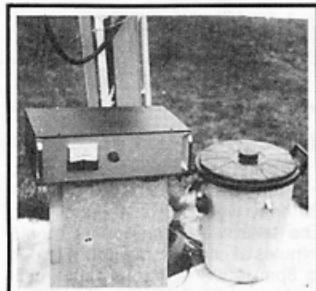


Fig 4. Base of antenna on 13-9-92 showing transmitter and loading coil (bin).

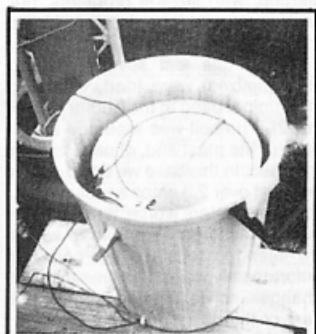


Fig 5. Close up of loading coil in bin.

We achieved about four amps of aerial current with about 90 watts input to the antenna. The counterpoise probably accounted for about 0.4 amps. The loading may not have been fully optimum, but was much better than in June. The big question is what was the radiated power? Methods of estimating this were described previously (Refs 2 and 4). If the antenna had no topload the current distribution would be triangular and the radiation resistance would be 0.24 ohms. If the top load was large and the current distribution was constant top to bottom, the radiation resistance would be 0.98 ohms. The actual radiation resistance lies between these extremes. No accurate measurement of distribution of parameters was made so, using calculation methods from the known geometry of the antenna, the radiation resistance is estimated to be 0.5 ohms. From I^2R radiated power equals eight watts.

The transmitting set-up at Gordon

The transmitter used in June was the original valve transmitter built by VK3ACA (Ref 2). It was crystal controlled with a fundamental on 196kHz. For the September tests we had two transmitters available, but used one made by VK3BDJ using a FET final and an HF crystal with a



Fig 6. Don VK3BDJ in his transmitter case shack.

frequency divider. The latter transmitter appeared to give better results, but the output of both on dummy load was similar. As far as we could measure, the output was between 80 and 100 watts.



Fig 7. Preparing for the day's activities.

Don's Gordon shack is in one end of his garage and is enclosed in an ex-3GL transmitter housing. The shack and several other items associated with the day's activities are shown in the accompanying photographs.

Technical Aspects

Calculations have been made based on a method given in a previous article (Ref 6). To give an idea of how the theoretical results compare with those observed, the figures are given in table 1. The calculations are based on a radiated power of 10 watts and field strength in dB above one microvolt/metre at the receiving antenna. A -10dB signal should be copyable in CW with a narrow bandpass receiver. It is assumed the reflection in the double hop case was over sea water. The daytime ionospheric wave case is calculated for a low solar angle case (winter or late afternoon). From this tabulation it is obvious that at this frequency the surface wave gives the best results in the day, and the first hop ground ionospheric wave is best at night.

Table 1

1 Surface distance - km	10	15	20	30	50	70	100	150	200	300	500	700	1000
2 Surface wave poor ground	69.0	65.2	62.5	58.5	53.2	49.3	44.7	36.9	27.4	18.9	5.4	-10.4	-21.5
3 Surface wave good ground	69.3	65.8	63.2	59.6	55.0	51.9	48.6	43.9	40.4	35.9	27.9	22.5	11.9
4 Ionospheric wave - day												-15.1	-4.7
5 Ionospheric wave - 1 hop night												-12.6	0.0
6 Ionospheric wave - 2 hops night												12.1	15.4
1.	1400	1800	2200	2600	3000	3500	4000	4500	5000	5500	6000	6500	
2.													
3.	11.9	-1.4	-13.6										
4.	4.2	2.3	-1.6	-3.5	-10.0								
5.	189	165	132	86	41	-64							
6.	-11.5	-5.2	-2.2	-0.5	0.9	-0.1	-1.9	-4.6	-8.4	-9.5	-13.8	-17.9	

References

1. Australian Amateurs on Long Wave. Jim Linton VK3PC. AR Jan 1984.
2. Experimental Stations on 196 kHz. John Adcock VK3ACA AR July 1984.
3. Long wave in Australia. Dennis Sillett VK3WV ARA July 1987.

4. Home Station Antennas for 160 metres. John Adcock AR May to August 1971.
5. VK Amateurs on 196 kHz. Donald Bainbridge ARA 29th Sept. 1992.
6. Propagation of Long Radio Waves. John Adcock VK3ACA AR June 1991.

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WIA News

Ron Wilkinson Award Winner

Recipient of the prestigious Ron Wilkinson Award for 1992 is Gordon MacDonald VK2ZAB, a resident of Berowra Heights, a northern suburb of Sydney.

Given for "special achievement in any facet of amateur radio", the Award honours the memory and achievements of the late Ron Wilkinson VK3AKC.

Gordon MacDonald VK2ZAB has been a long-time pioneer in terrestrial weak-signal, long distance VHF and UHF communications techniques, particularly in recent years in what is now referred to as "aircraft enhancement" propagation.

For some 10 years, he has kept regular schedules on VHF and UHF bands with other stations in Canberra, Melbourne, Brisbane and other distant points, seeking to experiment with and exploit the signal enhancement afforded by high flying passenger aircraft passing through roughly the mid-point of the path between two stations.

In that time he has developed the mode from an experimental, almost "hit-or-miss", exercise into a routine method of working interstate as far as Melbourne and Brisbane, from Sydney, on both 144 MHz and 432 MHz.

Until the early 1980s, when Gordon started work in earnest on the mode, these paths were considered "impossible" to bridge on these bands using terrestrial propagation.

At the Sydney end, Gordon has truly acted as an anchor for the fraternity of

amateurs attempting to experiment with and exploit aircraft enhancement propagation on 144 MHz and 432 MHz. He has often worked alone from the Sydney end, with little encouragement or interest from other operators, yet, unlike many pioneers, Gordon has publicised his work, advancing a detailed hypothesis on the propagation mode, one of the first people in the communications or scientific world to do so. And he chose the WIA's journal Amateur Radio to publish it.

Gordon's strategic efforts as a "Sydney anchor" over the past decade have contributed much to scientific knowledge on this propagation mode, clearly outweighing work contributed by amateurs in the USA and Europe, and sparking off others to write and publish technical papers on the propagation expressing differing technical points of view.

Gordon has done much to publicise and popularise the mode through writing articles in AR magazine, presenting lectures at seminars, club meetings and field days and always freely giving advice and sharing his knowledge in true amateur spirit.

Gordon has also served on the Council of the NSW Division, in the mid-1980s.

Probably the best testimonial to his efforts is the large number of stations now active on weekend mornings on 144 MHz and 432 MHz throughout South Eastern Australia. The mode is more regularly exploited in Australia than anywhere else in the world.

EQUIPMENT REVIEW

THE PacComm PacTOR Controller

Frustrated with Packet Radio? Is there a life after RTTY? Bruce Kendall VK3WL reviews PacComm's PacTOR Controller which may be just what you've been waiting for.

A few months ago I received a telephone call from the WIA General Manager to inform me that a package had arrived for me containing a PacTOR Controller. Could I come by the Federal Office and collect it for review? Thus started a challenging and often frustrating period of review and evaluation of the latest piece of HF data communications equipment from PacComm, of Tampa, Florida, USA.

What is PacTOR?

The full details and theory of PacTOR are well beyond the scope of this review to explain. For the uninitiated I would refer you to articles published in AR Dec 92 by DJ0OW, and March 1993 by 9M2CR, also the Oct 91 issue of QEX by DL6MAA and KF4KV. Briefly however, PacTOR is a mode of digital communication combining the power and integrity of packet radio with the durability of AMTOR, necessary on a high frequency communications circuit. Those of you who have had any exposure to RTTY, AMTOR, or Packet Radio on HF will be aware of the pitfalls of these modes when subjected to the noise, fading, static crashes, and other extraneous phenomena that are commonplace on these frequencies. PacTOR virtually eliminates all of these

problems whilst maintaining a respectable data throughput.

Product Description

The PacTOR Controller (PTC) came well packed ready for shipping and included a full serial cable, manual, circuit diagram, and connector suitable for making a radio interface cable to connect to a HF transceiver, and a 5.25" DSDD floppy disc containing the communications program "Procom". The first thing that strikes you about the unit is its solid appearance. Mounted in a well made cast aluminium case with clearly labelled front and rear panels, soft rubber feet are supplied to be attached to the underside to protect your operating desk. No 12 Volt DC power pack is supplied. I thought this was a pity. An Arlec mains adaptor was used during the review.

The front panel has 23 LEDs (refer photograph) which indicate status, mode, and tuning which is critical with data communications of this sort. The back panel contains output tone and level adjustments which are conveniently externally accessible, a power switch, HF radio port, a polarity labelled 12 VDC power input, DE-9 male connector, tuning scope output terminals, 3.5 mm paddle type Morse code key socket, and provision for a VHF/UHF Packet Radio outlet which

is available as an option but was not fitted to the test unit.

However, this consists of a separate printed circuit card and new front panel. The front panel PacTOR/Packet selector switch is already in place and only requires the fitting of the new panel and a push button switch cap. This would be an excellent addition for those requiring both HF and VHF/UHF digital communications without the need for constant changing of connections to radios and computers.

The PTC requires 11-14 VDC @ 400 mA although 300 mA is quoted as being the typical current drain. The micro processor used is the ubiquitous Z80 running at a clock speed of 6.144 MHz which is crystal locked by its own internal clock frequency generator, whilst a lithium battery maintains user set parameters and the real time clock during periods of power down. Firmware version 1.32 was installed in the test unit.

Both FSK and AFSK outputs are selectable by internal jumpers although FSK is the preferred mode, and in conjunction with a 500 Hz filter is a very effective transmit and receive combination. It was found that even during times of severe QRM, QRN, and QSB throughput was not noticeably affected with the above selection.

This review was done using a Kenwood TS940S transceiver and an ATN 13-30 8 element Log Periodic Array and an 80 m dipole. Both FSK and AFSK modes were utilised. It was found in AFSK mode (ie audio in the phone patch input and the radio selected to LSB) that best results were obtained with the SSB Slope Tuning set to 100% Low Cut, ie the lower half of the SSB signal completely cut off.

Installation

After unpacking, one is tempted to connect the computer, PTC, and transceiver together, after making up a radio interface cable. But it's not so simple! The first thing that strikes you when you unpack the device and read the manual, is the manual itself. Typical of most things to do with digital communication the writers of these instruction books appear to have difficulty coming down to an elementary level, understandable to



a relatively uninitiated person.

The manual for the review PTC left much to be desired. It lacked basic operating examples and clear parameter descriptions or how to use them, instead concentrating on the theory of operation and the history of PacTOR. In its favour the manual does come with circuit diagrams, a parts list, and a component overlay showing where everything on the PCB is positioned. It is significant to note that everyone I communicated with during the course of this review said they had the same problems with their PTCs, and this appears to be true regardless of brand.

The manual contains 56 pages in all and could easily be twice that size if written properly. I must admit to a personal prejudice in this area but firmly believe that many a fine piece of equipment in this field has been marred by manuals written for experts rather than newcomers to the mode.

The serial interface can be configured to baud rates of 9600, 4800, 1200, and 300, and again internal jumpers are utilised for this. The transmit PTT can be switched by either grounding via a FET, internal relay, or floating relay contacts. AFSK or FSK is also selectable in a similar manner. An intriguing option exists whereby the PTC can be controlled by a paddle type Morse key in AMTOR and RTTY modes! Morse characters are converted into corresponding ASCII characters and control characters such as ESC, Backspace, CR, and Control-Y have an assigned Morse code equivalent.

Why anyone would want to use this method of operation is a little difficult to understand. However, suppose you have a computer or terminal with a broken keyboard, a PTC, and you're good at using your paddle Morse key. You could still communicate via AMTOR or RTTY. (I can see you all champing at the bit to try this one out!) And this option too is jumper configurable.

The PacTOR Controller is configured as Data Communications Equipment, the same as an RS232C modem, whilst the computer or terminal is Data Terminal Equipment. Details of how to configure the serial cable using various combinations of DB-25 and DE-9 connectors, and

how to ensure that terminals get their required CTS, DCD, and DTR signals is detailed. Likewise, radio interfacing with the usual AFSK/FSK, ground, PTT, Rx audio, and optional power input or floating PTT relay connections, is also specified.

"The serial interface can be configured to baud rates of 9600, 4800, 1200 and 300."

Once the hardware configuration was done the terminal software was loaded into a Data General #One IBM compatible lap top PC. The software supplied as mentioned above is Procom. At first this proved to be a little user unfriendly but after a little time, and the realisation that it should be booted up from the PROCOM.BAT file which includes a few operator hints, all was well. I did try to use the excellent Packet Radio terminal program Paket V, but this suffers from the fact that the program interprets such characters as Control-Y, and the PTC requires a pure Control-Y character to change transmission direction in PacTOR mode. This I found to be a pity as Paket V is a better radio communications program than most and if the author Tony, VK2DHU, can come up with a suitable version that is PTC compatible he will be on a winner.

The above completed, the operating parameter defaults can be checked or altered if required. I found that the defaults were satisfactory for the purposes of the review, communicating over short (VK) and long (HB) distances.

Operation

Again I was frustrated by the manual. Getting into receive mode was difficult due to ambiguous instructions. However, after a little help, I managed to find the commands to "listen" to PacTOR, AMTOR, and RTTY signals. These are; L, 1, AM, and BAU, respectively. After listening around for a while it was time to try and make a connect. In PacTOR mode the command; C VK3WL will invoke an ARQ connect. A long path option can be initiated by; CI VK3WL. This is typically used over

paths of 40,000km, has a tx delay of 25 ms and a cycle time of 1.4 seconds. In longpath mode throughput is decreased to about 90%. However this feature was not required during the review. Depending on band conditions the PTC will adjust its baud rate to either 200 which is standard, or 100. And again depending on conditions Huffman data compression is automatically enabled or disabled. Control-Y is the Tx/Rx change over character. Another interesting feature is the auto CW ident. This parameter sends a 40 wpm identification every seven minutes.

To end a QSO simply send a Disconnect and the QRT procedure is performed. In the case of an emergency a DD command will terminate proceedings. Alternatively a Control D will suffice. An on-line HELP file is available which gives a brief description of the PTC commands. REMote control and access is possible by another station and a Personal Mail Box is available with a capacity of 21006 bytes.

Memory ARQ is a facility whereby incorrectly received packets are stored and overlaid to make up a complete and correct packet. This is achieved by applying the incoming signal to an A/D converter and doing a CRC checksum. If the check sums at the transmit and receive ends are equal, the next packet of information is sent. However, if the checksums do not equate the PTC stores the incorrect packet as an 8 bit value and overlays any incorrect packets subsequently received. If for example 3 incorrect packets are received and digitally overlaid one upon the other a correct packet can be constructed and a correct CRC response will then allow the next packet of data to be sent. In this way multiple re-tries are avoided as happens with Packet Radio. On the PTC a memory ARQ reconstruct is annunciated by the error LED on the front panel glowing green. If the LED is red a packet or control contains errors.

My first contact on PacTOR was with VK2ALS. Adrian was most patient in going through a series of checks and experiments to enable me to become familiar with this new mode. I subsequently checked into

the JA5TX BBS on 14.071/2/4/6/8 MHz and found that I got best results by tuning to 14.0708 MHz.

DK0MHZ also runs a BBS on 14.0715 MHz and for the 80 m enthusiasts DF0THW runs a PMB on 3.5926 MHz. Colin, 9M2CR can be found on 14.078 between 0800-1600z. PacTOR activity seems to be centred around 14.079 and 21.079MHz whilst in Europe direct QSO's are reportedly common on the 3.5838MHz. The AMTOR calling frequency is 14.075MHz. VK2AGE runs an AMTOR system on 14.075/7 and 21.076MHz, which might be worth having a look at. Certainly the JA5TX BBS is well patronized and is easy to get into from Australia most of the time.

Further PacTOR, AMTOR, and RTTY contacts were made with such stations as; ZL3MA, 9M2CR, JK1DNW, VK4SSB, VK4AZV, JA3NLT, VK2SG, and several European stations. And I would like to record my thanks to them for persevering with my requests for information and their willingness to participate in experiments during this review.

Conclusions

After getting over my initial frustration with the manual, I found the PacComm PTC to be quite user friendly. Certainly PacTOR is going to be the dominant digital mode on HF in the future, as technology stands today. One thought that did come to mind was the possible application of a PTC for international forwarding on the Packet Radio network instead of the current practice of using Packet on HF. The throughput would certainly be improved.

One would do well to consider the PacComm PTC in conjunction with the available VHF/UHF Packet card to make up a compact and modern digital station able to communicate on both modes.

PacTOR is still a relatively new communications technique and would suit someone looking for new horizons to explore or the Amateur seeking very reliable long distance digital communications.

The review appliance was supplied by Blamac Computer Services of 26b, Bombala Street, Cooma. 2630. Tel:064-52-3112. Fax:064-52-4317, to whom all enquiries should be directed.

AR single coil Z match

Lloyd Butler VK5BR* describes how to build it and how it works.

The idea of a single coil Z match tuner was brought to our attention by T J Seed ZL3QQ in the March 1982 issue of Break-In. He demonstrated how a tuned single coil could be connected to produce parallel resonance at two different frequencies and be tuned over two different tuning ranges without coil or capacitor switching.

ZL3QQ showed how the circuit could be designed so that the two ranges were complemented to produce continuous tuning over the complete range of 3.4 to 30 MHz. By using this arrangement as the shunt element of a Z match tuner, the single coil assembly replaced the two coil assembly of the conventional Z match.

The ZL3QQ Z match system was discussed by Random Radiators in the August 1992 issue of Amateur Radio. However, if you are interested in the mathematics of the subject, you should get hold of a copy of the Break-In article.

A further report on the Single Coil Z match appeared in "Random Radiators", which was published in the February 1993 issue of Amateur Radio magazine.

In that article, Ron VK3AFW and Ron VK3OM made reference to the

assembly, in Melbourne, of several experimental single coil Z match units and these have been sent over to me for a technical assessment. Where necessary, I have suggested minor changes which I found were needed to match a wide range of load conditions over the desired spectrum of 3.5 to 28 MHz. I also tried out some coils of my own. All in all, I have recorded quite a lot of data on different coil arrangements which worked quite well but, rather than confuse the issue, I will only report on the performance of one particular design which showed up best.

The unit discussed in "Random Radiators" is based on this design, except that they have changed the method of forming the coil, and at the time of going to print the fixing of the coupling coil was still under review. As I have discussed in previous articles, the wide load impedance range of the Z match unit is dependent on the coupling coefficient being somewhat less than one and a change in the assembly of the coupling system might alter the performance to that reported here.

Before proceeding further, please refer to the design of figure 1 which is described as being in use at ZL3QQ. The secondary winding of

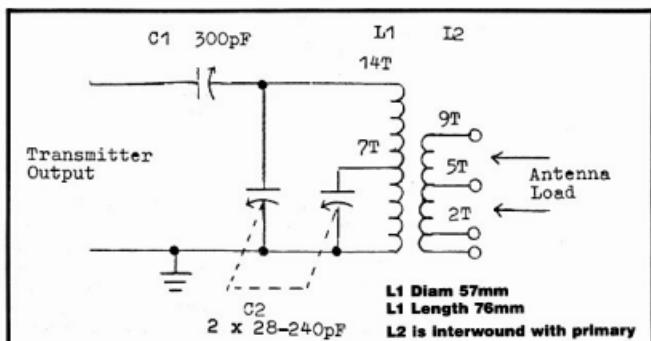


Figure 1 ZL3QQ Single Coil Z Match Tuner

the coil has 9 turns interwound with the primary and tapped at 2 and 5 turns. To provide an impedance load range, two, three, five, seven, or nine turns can be connected to the load. In our Z match units, secondary switching is not required and a wide load impedance range is achieved using a fixed secondary coil much like the fixed secondaries of the two coil conventional Z match unit.

What has been achieved is a very simple but versatile unit — one coil assembly, two tuning controls, but no switches. Despite its simplicity, the unit can match a complete load resistance range of 10 to 2000 ohms for all bands between 3.5 and 28 MHz inclusive.

This will be demonstrated further in the curves which have been included. Because our circuit is a little different from that submitted by ZL3QQ and in our view a refinement, we had to give it a name. Because it results from the work of a number of amateurs who support AR, we have called it the 'AR Single Coil Z Match'.

Whilst the main purpose of this article is to report on the performance of a simple single coil Z match unit to operate in the 3.5 to 28 MHz region, I will follow on to show how the operation can be extended down to 1.8 MHz by the addition of a switch and a few fixed capacitors. This might be of interest to those who would like to experiment with the Z match on that band.

The Preferred Unit

The circuit diagram of the Z match unit to be described is shown by figure 2. The primary coil has 14 turns of 16SWG tinned copper wire at a diameter of 57mm and wound over a length of 84mm with a tap in the centre at 7 turns. Up to this point the coil design is very similar to the ZL3QQ primary coil. However, unlike the ZL3QQ unit, our secondary (spaced around the primary) has 4 fixed turns of 16 SWG tinned wire at a diameter of 67mm and wound over a length of 24mm.

The first turn of the secondary is lined up between with the first and second turn at the "earthy" end of the primary coil. The assembly is held in place by a 3mm thick perspex sheet drilled as shown in figure 3 to locate

the spiralled wires and made to the same construction method as described previously for the two coil Z match. (Refer Random Radiators, Amateur Radio, March 1990). The construction method has the advantage of rigidly controlling the coil inductance and the coupling coefficient which are the two main factors in defining the characteristics of the unit.

By following the construction procedure, one can be confident that the results given here are repeatable. Apparently a number of radio amateurs have been discouraged from building a Z match tuner because they have not felt confident in making this type of coil assembly. This is the reason why Random Radiators has discussed the alternative use of a PVC former which they hope will make construction easier.

"A very simple but versatile unit — one coil assembly, two tuning controls, but no switches."

Comparing our figure 2 circuit with that the ZL3QQ circuit in figure 1 you will notice that we have tapped the input capacitor down the coil to the 10 turn point. With the input capacitor at the top and the fixed secondary, we were not able to get the impedance range on the higher frequency bands. Tapping down the coil magically corrected the problem and gave us a wide load impedance range at all frequencies. The tap at 10 turns has been carefully selected. The further it is tapped down, the larger the input capacitor needed to match low impedances at 3.5 MHz. At 10 turns we need no greater than 350 pF.

As you proceed further and examine my curves, you will see that we can carry out all the matching with an input capacitor of 350 pF maximum value and a split stator capacitor of 250 pF maximum value. Of course, you can use larger than these values but make sure you also have low minimum capacities. To match some load resistances on

some of the bands, we need capacitance as low as 20 pF.

Operation

How does it all work?

For those who are not up to delving into the ZL3QQ mathematics, I will try to give a simple explanation. A Z match circuit is in reality an "L" network of series capacity and shunt inductance which in its basic form can transform a given load resistance to a lower value at the network input. The series capacitor in the circuit is self evident but the shunt inductance is formed by tuning the parallel tuned circuit to the inductive side of resonance.

If we ignore the coupling coil and connect the output straight across the tuned circuit we can imagine the whole network to be one complete tuned circuit at resonance with the source signal fed in series with the circuit at low impedance and the output connected in parallel with the circuit at high impedance. If we understand tuned circuit theory we can deduce that the impedance transformation ratio is almost equal to Q_l^2 where Q_l is the loaded value of Q. Of course, the impedance transformation is further modified by the turns ratio between the coupling coil and the primary coil and by the extent of their mutual coupling.

In the conventional Z match tuner, the shunt circuit is made up of two coils of different inductance, each with its own output coupling coil. As a basic idea, the larger coil is provided for the lower frequency range and the smaller for the higher frequency range. A switch is provided to select between the two coupled outputs. In actual fact, the circuit operation is really more complicated than this as the two coil circuits, in conjunction with the tuning capacitors, are interactive with each other. In using the Z match unit we have found that a large coil for low frequencies and a small coil for high frequencies does not always apply and usual procedure has been to try both outputs for the match whatever the frequency.

ZL3QQ has depicted the complete two coil arrangement as one circuit which has two resonant frequencies and with variable tuning, two separate

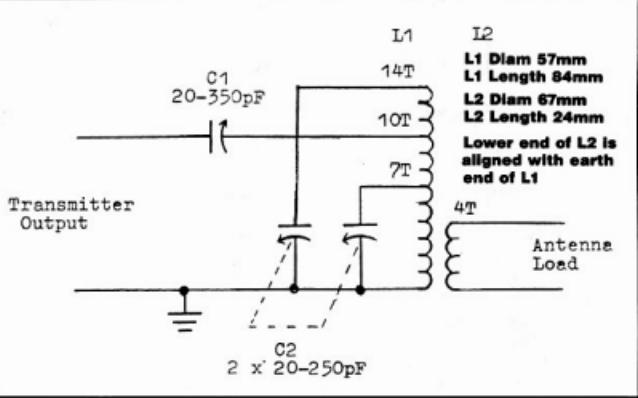


Figure 2. AR Single Coil Z Match Tuner

tuning ranges. He substitutes this with a single coil assembly tapped at the centre, or some other point part way down the coil, as shown in figures 1 and 2. Again the circuit has two resonant frequencies and with variable tuning, two separate tuning ranges. The lower frequency tuning is influenced by the inductance of the full coil and the higher frequency tuning by the inductance reflected at the tap. By appropriate design of the coil unit in conjunction with selected tuning capacitance, the top end of the low frequency range is made to just overlap the bottom end of the high frequency range and provide a continuous coverage over 3.5 to 30 MHz. Of course to make up the shunt arm of the "L" match network, the parallel circuit tuning capacitor is set to a value less than that for resonance so that the circuit actually looks like an inductance.

One thing which has an important bearing on how well the Z match works is the output coupling circuit. If we coupled the parallel circuit straight across the load or coupled through a 1:1 ratio transformer, the "L" match circuit would be unable to reflect a resistance to the input any lower than the load resistance itself. That is for 50 ohms input, the lowest load resistance would be 50 ohms. To match lower load resistances, we have to make them look much higher to the matching network. This is achieved partly by the step down turns ratio and partly by keeping the

coupling coefficient somewhat less than one.

The low coefficient introduces leakage inductance but it also introduces a higher reflected resistance component. For very low load resistance values, the reflected resistance actually increases as the load resistance is lowered. This is one reason why we can match such a wide load resistance range in the Z match unit and hence why I previously emphasised rigid control of the degree of coupling in making the coil assembly.

I guess some explanation should be included concerning our input tap in figure 2. In testing various forms of the single coil assembly, we usually found that there was a need to trim the total number of turns, or the position of the split stator tap, to make the unit work over the wide load resistance and frequency range. In the case of the figure 2 design, tapping down the input capacitor was the modification needed to make the unit work so well over the whole testing range. The improvement was found by experiment and exactly how it has changed circuit parameters has not been fully examined.

It is interesting to observe some of the effects of two resonant conditions in the single coil assembly. In one arrangement tested, we had a fairly large split stator capacitor (around 440 pF). With this model, it was possible to match 14 MHz near both maximum and minimum capacity

ends of the split stator capacitor. This was all done with the same setting of input capacitor.

In the second and final part of this article, which will be published next month, Lloyd discusses the performance shown by his experiments on the AR Single Coil Z Match, PLUS a modification to enable its use on 160 metres.

* 18 Ottawa Avenue Panorama SA 5041
ar

WIA News

NEW WIA MEMBERS

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of October 1993.

L20915	MR C FLANAGAN
L20916	MR G TANOS
L20917	MR R TOOBY
L20918	MR T F VANDERMEEL
L20920	MR K RATKOVIC
L20922	MR P BHAT
L31525	MR R KELLY
L40341	MR L UNG
VK1KCS	MR C F SCOTT
VK2BVH	MR B H HALPIN
VK2CLC	MR C L CRONIN
VK2FUU	MR F A WRIGHT
VK2GVI	MR G G RAJOYOGAM
VK2GWA	MR D PHILLIPS
VK2GBX	MR K M HAWKINS
VK2KDQ	MR D J GARDINER
VK2MMH	MR G RAJOYOGAM
VK2NQ	MR J BRAND
VK2NSS	MR N S STEELE
VK2TBG	MR A JOHNSTON
VK2VVV	MR K J DRAPER
VK2XOI	MR V N STAFFORD
VK2YDJ	MR D J JONES
VK2YKI	MR G M HAMMOND
VK3END	MS M HAMILTON
VK3FBG	MR B CURTIS
VK3NAC	MR C HONE
VK3NDI	MR D I MAYES
VK3PAJ	MR P JOY
VK3ZSR	MR B RILEY
VK4COZ	MR P N HOLTHERM
VK4NAC	MR N A FAULKNER
VK5AKQ	MR J L SCHAUMLOFFEL
VK5BJA	MR D G GILES
VK5KBW	MR B WARNER
VK5KCW	MR M UCHIDA
VK5NSD	MR D STEFANAC
VK5ZLM	MR T L C HARDING
VK5ZWI	MR G R WILLIS
VK6BIE	MR W P MCNAMARA
VK6YCG	MR A B PATTERSON
VK7BF	MR B F FRITSCHIE
VK7NT	MR M G TOWNSEND
VK7ZRF	MR R F GRANT
VK8ZZ	MR G HEMING

TECHNICAL ABSTRACTS

Gil Sones VK3AUI

SKYLOC

SKYLOC is a HF Locator Beacon system developed in Australia. A range of spot frequencies is used in a sequence of transmissions to ensure that suitable propagation is encountered. The system operates in the 3 to 16 MHz range and uses a 10 Watt Tx and an integral loop antenna or an external antenna if available.

The receiver system uses an array of seven antennas to receive the beacon signal. The received signals are analysed to determine both the direction and vertical angle of arrival of the signal. Using either predicted or measured data on the height of the reflecting ionospheric layer the location of the beacon can be calculated.

Use of an HF system offers extended range with little time delay in the detection and location of a beacon. Other VHF and satellite systems whilst effective suffer with respect to their range and the possible time taken to acquire a signal. Both critical factors for the success of a search and rescue operation.

The system is an Australian development. An outline of the system appeared in The Journal of Electrical and Electronics Engineering Australia September 1992 published by the IE Aust and IREE Aust. The authors were Messrs Goodwin, Jeffrey, and Hichens.

Australian work on HF propagation and ionospheric research and HF direction finding has been carried out over a number of years. This application is one use of such research work. The Jindalee project is another significant use of HF Techniques.

Handheld Roundup

A rather interesting comparison of handheld transceivers was published in QST Oct 1992 by J W (Rus) Healy NJ2L. Ten handhelds were purchased and given a lab test as well as being field tested over a 12 week period by a panel of users.

Some of the handhelds are not as widely available in Australia but the technical test results make interesting reading. The units tested were not units submitted for test by manufacturers. The review team obtained a second test sample of one of the rigs when an under performance was suspected. Only a big organisation like the ARRL and QST can afford such testing.

The figures obtained for some radios that are locally available are shown in Table 1. Remember that these were obtained from a small sample of radios bought over the counter in the USA. They did however conform to specifications where given.

The level of Tx spurious emissions was within the USA standard in all cases.

The sensitivity and IMD performance figures are of interest in assessing the performance of the radio. This is especially so where disturbance from adjacent services may occur. The use of an external antenna instead of the supplied whip may also worsen the potential for disturbance.

The Tx power is given for the standard battery pack. Many handhelds will give 5 watts if a 13.8 volt supply is used. However at 5 watts output users should very seriously consider the likely field strength in the vicinity of the antenna.

It may well be approaching a level which may give cause for concern. Many other factors are involved but the potential is there.

The turnaround time given is the time for the receiver audio to recover after transmission. This has some relevance to operation with packet. Also of relevance to packet use is the time from pressing the PTT to the transmission of a distortion free signal. The PLL does take some time to settle down. These times are involved in the selection of the timing of the packet system. With laptop computers and micro TNCs many handhelds see service on packet.

Metal Boom Helical Antenna

A metal boom helical antenna is described in QEX Jan 1993 by Ron Lile K0RL. This design does away with the use of a wooden or other insulating boom in a helical antenna.

The only non-metallic structural items are the helical element support stand-offs. This should result in a far more durable structure. The element support standoffs used were dowel but some sort of plastic support may be possible. One possibility would be the plastic riser tubes used in garden watering systems. Alternatively you may even resort to chopsticks as Colin Richards 9M2CR did in his article AR Jan 1980.

The maximum boom diameter mentioned in QEX was 2.5 inches or 62.5 mm for a 432 MHz helical. The design published however used a square section tube of 13/16th inch or 21 mm. The size is not particularly critical and 20 mm or 25 mm would be useable.

The boom and reflector screen frame are shown in Figure 1.

Table 1

Radio	ICP2AT	TH28A	FT411E	FT415
Sensitivity dBm	-124	-125	-121.5	-123.5
12 dB SINAD				
Two Tone 3rd Order	65dB	64dB	43.5dB	64.5dB
IMD Dynamic Range				
20 kHz Offset				
Adjacent Channel	70dB	63dB	63dB	68.5dB
Rejection 20 kHz Offset				
TX Power Watts	0.49/	0.015/	0.77/2.38	0.67/
with Std Battery	1.5/2.3	0.66/2.16		1.74/2.2
Tx Rx Turnaround Time				
Mute On m/s	120	54	95	160
Mute Off m/s	120	54	70	120

SUPPORT

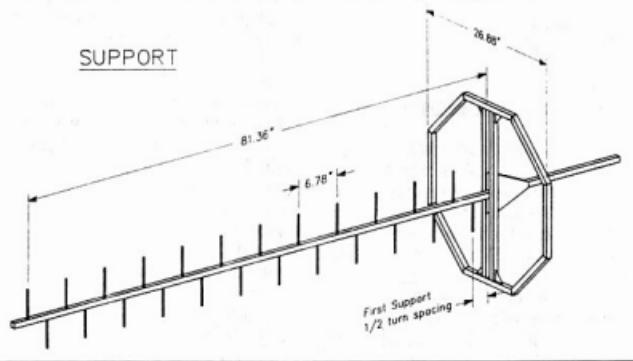


Figure 1 — Metal Supporting Structure for the Helical Antenna.

The radiator was made of flat aluminium wire and the reflector from aluminium mesh.

Some variation here to suit local products is possible.

The antenna dimensions are given below:-

Centre Frequency	435 MHz
Wavelength	687.3 mm
Diameter of reflector	687.3 mm
Diameter of Radiator	0.006 to 0.05 wavelength 4.13 mm to 34.4 mm
Pitch Angle	12.5 degrees
Radiator Circumference for Max Gain	1.13
Radiator Diameter	247.3 mm
Pitch or Turn Spacing	172.1 mm
Boom Length (12 Turns)	2065.9 mm

A point of interest is the mention of the use of a quarter wave cup to obtain maximum gain. This would appear to be a quarter wave edging around the reflector screen. Its action would appear to be analogous to the use of multiple reflectors with yagis or the skirt seen on many dishes.

Radial Line Stub

Quarter wave and half wave stubs are frequently used at VHF and UHF where they provide a convenient means of decoupling bias and supply circuits. An improved version was described by Geoff Krauss WA2GFP in the Jan 1993 edition of QEX.

The familiar use of a half wave track for decoupling is shown in Figure 2.

The quarter wave stub of low impedance, the wide one, transforms a high impedance into a low

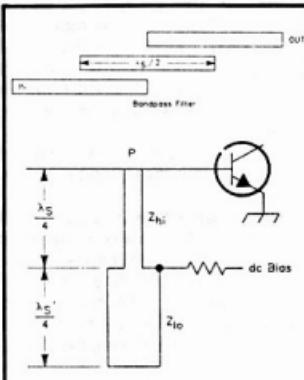


Figure 2 — Stub Decoupling.

impedance where the dc bias circuit is connected. This point is connected to the base circuit at P by another quarter wave line of higher impedance, the narrow one, where the low impedance has once again become a high impedance and so does not load the circuit. This may also be referred to as a half wave line. The reason for the differing impedance of the quarter wave lines is to maximise the effectiveness of the configuration.

A complication arises in that the quarter wave lengths will be different lengths due to the line characteristics and that the transition point is not as well defined as the designer may wish.

There are thus some uncertainties in making the design work as

expected. This may result in some unfortunate results and some cut and try design.

The way around the problem is to use a radial line stub which is shown in Figure 3 and Figure 4.

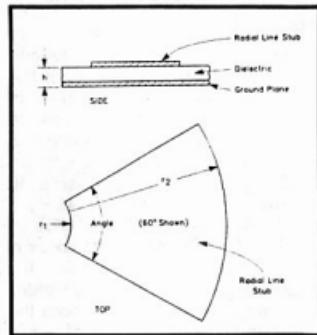


Figure 3 — Radial Line Stub.

This has a broad resonance region and also exhibits a well located attachment point. The stub is an angular sector of between 60 and 90 degrees. The attachment point is at the centre where the radius is r_1 . See Figure 4.

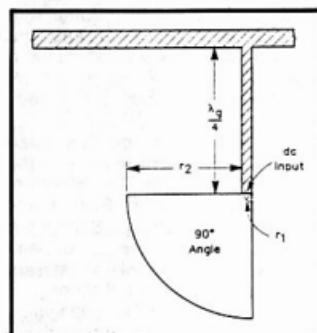


Figure 4 — Radial Line Stub used for Stub Decoupling.

Intending constructors should obtain the source article as the calculation is dependent on the material used and the angle used for the stub.

10 GHz FM ATV Transmitter

A simple 10 GHz FM ATV transmitter appeared in the Rad Com column Eurotek by Erwin David G4LQI. The original was in Old Man

Sept 1992 by author M Vonlanthen HB9AFO.

The details of the 10 GHz oscillator are shown in Figure 5.

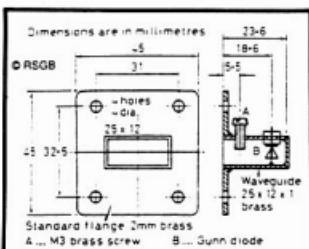


Figure 5 — The Gunn Diode 10 GHz Oscillator.

Alternatively a commercial assembly could be used.

An Iris with a 7.8 mm diameter hole is used between the oscillator and the horn antenna to control loading of the oscillator. The horn antenna is shown in Fig 6.

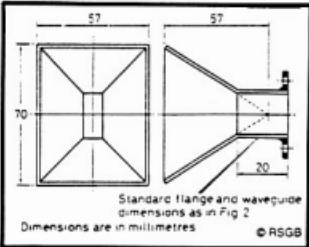


Figure 6 — Simple Horn Antenna 15 dB Gain.

The modulator is shown in Fig 7. The video signal is connected to the voltage divider in the voltage regulator circuit. This provides loading for the video source and couples it into the voltage regulator modulating the output voltage. The voltage output should be set for the best result with the Gunn Diode.

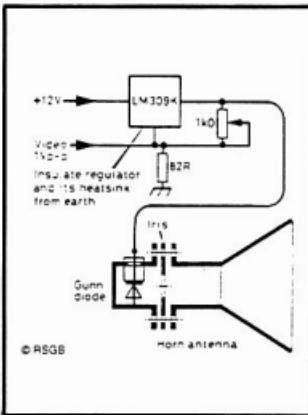


Figure 7 — Frequency Modulated 10 GHz ATV.

Some interactions should be expected but it is a very simple circuit. Even at such low power levels care should be taken not to look into the antenna or waveguide and keep away from the open end when transmitting.

air

WIA News

Spectrum Management Matters

The Radiocommunications Act 1992 will come into effect on 1 July 1993.

Several major reforms are introduced by this new Act, the major one being the establishment of a "market-based" system of spectrum management in selected parts of the spectrum. Fortunately, the amateur bands are exempt.

The new Act will be administered by a Spectrum Management Agency (SMA), currently being set up, which will supersede the role of sections of the current Department of Transport and Communications (DOTC).

A release from DOTC in February advises that "users will be consulted by way of the newly established Radiocommunications Consultative Council."

Meanwhile, in Geneva, Switzerland, major reforms to the structure and functioning of the International Telecommunications Union (ITU) were included in a new ITU Convention and Constitution, taking effect from 1 March.

Part of this reform does away with the old World Administrative Radio Conferences (WARCs), held every decade or so, replacing them with "mini-WARCs" to be held every two years to deal more effectively with changing demands on the radio frequency spectrum.

These will be administered by a newly-established Radiocommunications Bureau. For the WIA, this means more constant work on international matters and more frequent attendance at overseas meetings.

In addition, the ITU has established a Telecommunications Standardization Bureau to "deal more vigorously with the development of standards for telecommunications services, including radio-based technologies."

RADIO TECHNICIAN

We are looking for a young two-way radio technician skilled in the operation and repair of modern mobile radios and bases. You will also have an excellent knowledge of digital data transmission techniques, as well as being computer literate. Not only will the successful applicant have a good practical ability, but also be self-motivated, and have good communication and customer relation skills.

We are a progressive, growing communications company, specialising in sophisticated mobile data communications, and the successful applicant will join an enthusiastic team of dedicated professionals.

Please apply in writing with your resume and experience to:

The Manager,

Raywood Communications Pty. Ltd,
2/27 Normanby Road, Notting Hill,
Vic, 3168.

WIA News

WIA Policy Revamps

Continuing with publication of the 12 revamped Federal Policy items, commenced in last month's WIA News, this month we present three more, covering

Gentlemen's Agreement

This Board NOTING:

The strong desire to attain high level of self regulation and self discipline within the amateur radio service whilst retaining maximum flexibility of use of bands;

The conflicting needs of various modes as regards necessary bandwidth, susceptibility to interference from adjacent signals etc;

The increasing numbers of stations using amateur bands;

The desire to guide newcomers into habits likely to achieve easy assimilation into our service;

The need to establish special purpose nets, new and different mode nets, whilst encouraging the best use of bands and further experimentation into new techniques.

This Board RESOLVES:

Each MF and HF amateur band (including any new allocations) be governed by a "Gentlemen's Agreement" such that it is divided into broad segments viz:

CW

Narrow Band Modes

Wider Band Modes;

Such agreement to be coordinated world wide or at least Region wide so as to achieve minimum conflict;

Special purpose and different mode nets and operations not available to Novice licensees be conducted outside Novice segments;

VHF/UHF/SHF bands be planned nationally along similar lines, as at present;

Such agreements and plans should be widely publicised to all new and existing licensees through publication of the Australian Amateur Band Plans. Furthermore all licensees should be strongly encouraged to adhere to the spirit and principles of such plans.

References:

Previous version: 82.09/2/1 Appendix C3

Revised: May 92 & Jul 92 Board meeting

Adopted: Oct 92 Board meeting

Narrow Band Modes

This Board NOTING:

In 1986, Federal Council adopted and published in "Band Plans for the Amateur Radio Service" the following definition. "Narrow Band" designates narrow band modes (other than CW) occupying band widths less than 1.12 kHz. Narrow band modes use an appropriate modulation technique and speed to stay within the designated bandwidth. They can include ASCII, RTTY, AMTOR and Packet Radio.

AOCP and LACCP are minimum licence requirements for narrow band mode transmission;

The desirability of agreed calling frequencies and frequency allocations for such transmissions;

The different types of store and forward repeaters being developed;

The different types of narrow band modes in use and being developed;

The increasing number of narrow band mode users;

The need for agreed technical and other standards.

DOTC regulations permit the following types of emission:

— K12F1A/F1B/F1D: Frequency shift keying using a frequency shift of not more than 850 Hz;

— K600A2A/A2B/A2D: Audio frequency shift keying by amplitude modulation of a carrier by a keyed audio tone. The occupied bandwidth not to exceed +/- 3 kHz.

— K600F2B/G2B/G2D/F2A/G2A/F2D: Audio frequency shift keying by frequency or phase modulation of a carrier by a keyed audio tone. The occupied bandwidth not to exceed +/- 3 kHz.

DOTC regulations permit the use of any internationally recognised code, including:

Baudot CCITT2

ASCII CCITT5

AMTOR/SITOR CCIR

This Board OBSERVES:

The following technical standards for extant modes:

Commonly used standard shifts are 170 Hz, 425 Hz or 850 Hz. The recommended shift for amateur use is 170 Hz.

The standard tone pairs used are:

Low tones			High tones		
Shift	Mark	Space	Shift	Mark	Space
170	1275	1445	2125	2295	
425	1275	1700	2125	2550	
850	1275	2125	2125	2975	

(Note: tones given in Hertz)

The use of either high or low tones will be governed by the individual's choice and may be determined by the pass band of the transmit audio circuits and/or IF filter. On VHF/UHF high tones are recommended where possible for compatibility.

The standard transmission speeds (baud rates) commonly used are:

AMTOR — 100

Baudot — 45 50 57 75 100

ASCII — 110 150 300 upwards

It is recommended the following speeds be used for MF and HF transmissions:

AMTOR 100

Baudot 50

ASCII 110

The standard formats commonly used and recognised are:

AMTOR: 7-unit code (synchro-nous)

Baudot: 7.5-unit code (1 start, 5 data, 1.5 stop)

ASCII (110 baud): 10-unit (1 start, 7 data, 2 stop)

ASCII (300 baud up): 9-unit (1 start, 7 data, 1 stop).

Recommended frequency segments and calling frequencies are as published in the Australian Amateur Band Plans.

and RECOMMENDS

Technical and operational standards and practices should be researched and promulgated for the benefit of existing and future users of these modes and as part of

an awareness program for the benefit of non-users.

Liaison with operators groups re technical standards and operating practice shall be the responsibility of a member appointed for the purpose to the panel of FTAC.

Regulatory requirements for all narrow band modes, as well as for store and forward repeaters should be researched and amendments suggested where necessary.

References: 85.04.08/2

Previous version: 84.09.04 Appendix A
Revised: May 92, Jul 92 Board meeting & Oct 92 Board meeting

Adopted: Oct 92 Board meeting

Amateur Television

This Board NOTING

The high degree of expertise required by amateur radio licensees in the transmission of television pictures on the amateur bands, RECOMMENDS

The encouragement and promotion of the development of advanced ATV modulation modes in keeping with modern technology, eg VSB, FM, digital and narrow band ATV;

Promotion of 1296 MHz and above for ATV use;

Encouragement of publication of articles on ATV in Amateur Radio magazine;

Promotion of training programs and weekend workshops on ATV;

Production and transmission of technical training films or video tapes concerning amateur television and related subjects;

Utilisation of the skills gained in ATV to produce video tapes on technical amateur radio subjects for circulation to regional members and clubs;

The siting of every ATV repeater should be thoroughly researched bearing in mind the peculiarities of TV transmissions in comparison to other modes. Note that because of the limited number of ATV channels available, all applications to DOTC for an ATV repeater licence should go via the WIA for co-ordination;

Appointment of a Federal ATV liaison officer as a panel member of FTAC. This Officer to be responsible for liaison between ATV groups in each state on matters including:

technical standards for repeaters,
ATV channel allocations,
exchange of technical information,
organisation of publicity and training,
and liaison with the Federal Video Tape Co-ordinator re
production and distribution of training material.

The WIA make the fullest possible provision for ATV simplex, in-band repeaters and cross band repeaters in its band plans, bearing in mind the need for spectrum efficiency and the spectrum needs of other modes.

The WIA seek an ATV allocation in the 600-950 MHz region to replace the 50 cm bands.

References: 78.1215 80.126 81.124
Previous version: 84.09.14 Appendix A
Revised: May 92 & Jul 92 Board meeting & Oct 92 Board meeting
Adopted: Oct 92 Board meeting

IMPROVING SELECTIVITY BY PRE-SELECTOR

Robert R McGregor VK3XZ * says "You must hear them to work them!" and tells us how!

It is signal reception that makes it worthwhile to put up "a piece of wire" to produce radiation, and to transmit a signal (ref 1).

Any conductor in an exposed position will intercept radiation quite impartially, 10.2 kHz Omega to GHz satellites. Appropriate type and sized reflectors can be used to concentrate the radiation onto a collector for improved signal strength.

In the sea of signals there is, we hope, one of interest to ourselves. The objective is then how best to select it in preference to the multitude. In our jargon, tune it in whilst rejecting other signals — selectivity, elevate it above the incoming and the receiver's internal noise — signal/noise ratio and de-modulate it.

Superhet Penalties

The superheterodyne method of reception is almost universal, but this piece of technology has a few built-in penalties. The locally generated oscillation must be very stable and free of noise or harmonics. There are two, in fact, several, signals since the converter is efficient at harmonics of the oscillator frequency, that can be heterodyned to produce the intermediate frequency (IF). The most important is the Image frequency, the alternative signal that is also displaced by the IF from the local oscillator frequency.

The second important factor is that all mixers are noisier than amplifiers, so that for minimum noise all mixers should be preceded by a low noise amplifier of sufficient gain that is the determining factor on internal noise in the receiver.

The third consideration is the maximum input signal level at the input before any stage preceding the main "selective amplifier" overloads and itself becomes a mixer of all the incoming signals — inter-modulation.

This results in many spurious signals and degradation of the desired signal. The continuous increase in output power by all services has worsened this problem. The original valve receiver could cope up to 250 mV, and with the use of beam switching valves — several volts. Transistors will accept 50 mV and later double balanced mixers above 100 mV.

Mixer Overload

The mixer stage is usually the most vulnerable to overload, and pre-mixer gain for low noise reduces this overload ability. There has to be a trade-off; a maximum gain of 10 to 20 dB, with provision to reduce this to 7 dB or less when the signals are strong. Study concluded? Well, not quite. If we examine the current design philosophy, it certainly provides gain reduction before the mixer, even switched pads at the Rx antenna input, but minimal pre-mixer selectivity, yet this aspect is equally important!

The receiving antenna itself can make a considerable contribution. It should provide the best signal/noise pick-up with just sufficient signal level for clean de-modulation and not enough for inter-modulation. There should, if possible, be a limited vertical and horizontal reception — directivity — with a null for strong local signals being a plus. Tuning with a high-Q circuit reduces the frequencies it will accept.

Always consider a pre-selector for DX, and for serious work below 7 MHz in a metropolitan area, a high pass filter to reduce B/C fundamentals. A current advertisement in AR for a very high grade receiver proudly proclaims two tuned circuits before the mixer, so also with Drew Diamond's converter in AR, June '91. First class receivers in the

late '30s had three tuned circuits of excellent Q, and there are reports of HF receivers in very difficult situations having five and six tuned circuits preceding the mixer!

Faraday Screen

Centre-fed short horizontal and vertical dipoles with a tuned feeder system are suitable for initial signal selection. The coil in the tuned system is inductively coupled via a Faraday static screen that intercepts common mode signals on the feeder and allows them to be bypassed to ground. A link coil then couples the tuned coil to the 50 ohm Rx input. Fig 2 is for solenoids, Fig 3 is for toroids.

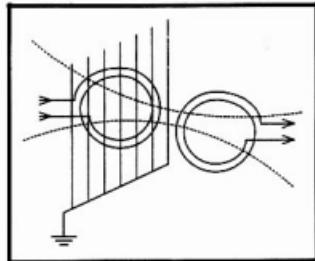


Fig 1 — Principle of Faraday screen

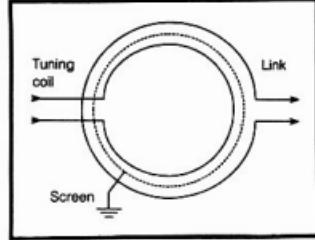


Fig 2 — End view

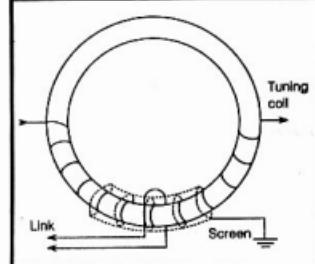


Fig 3 — Plan. Toroidal core

The use of a very high IF will spread out the primary and secondary images but have absolutely no effect on reducing inter-modulation problems. Only some form of tuning at signal frequency, together with input level control, can reduce the "pile up" at the mixer. Broad-banding is fine for transmitters and their antennas. It is no asset to reception between antenna and speaker.

Separate the Rx and Tx antennas if possible, and always protect the Rx input with a shorting relay and back-up diodes. Two 3 m fishing, curtain or bamboo poles, some ingenuity, 300 ohm ribbon and a tuned circuit puts you in business.

Wind spaced turns of 0.5 mm or 20 amp fuse wire over a plastic film on a former the size of the coil to be screened. Solder on a shorting bar and leave a tail. Cement the wire to the sheet and cut the winding longitudinally for removal, and place over the coil. See that the ends do not touch; they can overlap. Use insulated wire for the link coil.

References

1. 'A Piece of Wire', McGregor, AR May '91, p. 20.

Editor's Note:

While early valve equipment had high Q tuned RF amplifiers, sometimes several, the designer had little option. The valve is a high impedance, high capacitance device. The only way to handle the capacitance at radio frequencies was to make it part of a resonant circuit. The Q of the resonant circuit was set as performance demanded. The broadband, untuned RF amplifiers common in modern solid state equipment would have been impossible with valves...VK3ABP.

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ar

Remember to leave a three second break between overs when using a repeater.

AMATEUR RADIO EQUIPMENT PRICES

Gil Sones VK3AUI

The price of transceivers seems to move inexorably upward. Often comparison with what we remember paying leaves us feeling we are being priced out of the market.

Memory of the good old days is somewhat unreliable particularly with regard to prices, wages and our life styles. Both wages and prices have spiralled upward and there has been some readjustment of taxes and other costs. We have come to expect a wider range of appliances and electronic goods. True the relative cost of the electronic goodies has dropped and they are now more affordable.

When HF SSB transceivers arrived in the mid 1960's the price of 300 pounds or \$600 may seem very reasonable to us today. However in today's money the price is equivalent to \$4000 approx. Not so very different to the upper end of today's transceiver market. The early transceivers had none of the refinement of today's transceivers. One VFO and one filter and that was about it. Even our current basic transceivers have more features and performance and they cost half the price.

In 1970 the FT101 arrived and the price then was \$525. This was quite an advance on earlier transceivers but there was still only one VFO. In today's money the price is equivalent to around \$3000. Not quite so good for the features and performance.

The Ken KP202 arrived in 1973 and at \$150 it would seem cheap. However that only brought a few channels and today it represents a price of around \$700. Not quite so good when compared to a modern two metre handheld.

Icom released the IC22S in 1976 and from \$220 up to \$299 in the late 70's they were good value. Today the initial price represents \$600 approx. More or less close to today's prices but the modern radio is much more sophisticated.

The modern HF transceiver really got going in the 1980's with the benefits of technology giving us small, light, many-featured transceivers at from around \$1300 up. True, if you want more features you can pay more, but the transceiver becomes quite sophisticated around the \$2000 mark. ar

TRY THIS

Make your own polystyrene solution

Graham Thornton VK3IY *

Those of us who can remember the good(?) old days of coil winding will recall the use of polystyrene coil dope. This was used to provide a low-loss sealant and to keep the turns secure. If you want to get a strange look from your component store salesmen, ask for some! However, all is not lost — it's quite easy to home-brew.

There is an abundance of waste expanded polystyrene in the environment, ie 'styrofoam'. This dissolves readily in ordinary turpentine. The fizz given off is the release of normal hexane used to expand the polystyrene (beware — inflammable). It takes quite a volume of

this material to make a little solution. The polystyrene is not soluble in every component of the turps. The end result is a two-layered solution. The viscous lower solution is the desired result. Simply pour off the supernatant liquid. (No need to waste it — it's still useful turps).

It can be applied with a small brush. It seems to take overnight to dry. The same material can be used to make castings for insulators, if desired. Dowelling spreaders, dried in the oven, and painted with this solution, are excellent for transmission lines, eg tuned feeders.

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Modifying the Philips FM-828 to auto-scan

Ron Graham VK4BRG * describes his thoughts, and provides examples for a simple and very useful modification.

Over the past few years, a number of these radios have been acquired by amateurs and used for voice and digital repeaters where their robust nature and reliability have been proven. I am also aware that they have been used for dedicated packet and voice applications in the shack. My requirement for auto-scan was due to having two voice repeaters in the area that I wished to monitor without tying up my main two-metre radio. As more of these radios seem to be coming available, and I feel sure others could be in a similar position of wanting to scan two or more frequencies, these notes may be of use.

The VHF bands are covered with the 828 in the following frequency ranges: A band: 146 to 175 MHz; B Band: 132 to 157 MHz; and E Band: 68 to 88 MHz. I have not seen the Band C, which nicely covers the 2m band, but the Band B will cover all the 2m band. This model, which covers the high VHF commercial band, is currently being phased out of that service, and is the model I have used.

Different models

Mark I and Mark II, together with both remote and local control models, are available. The Mark I is easily

identified as it has a stainless steel case; whereas the Mark II has a black case fitted with quick release catches. The RF boards are essentially the same in both types, but the receive audio/power supply boards are quite different. However, electrically they carry out similar functions. Naturally, I would give preference to the Mark

"I decided to scan three channels, and have utilised fairly basic circuitry."

II, but the Mark I is quite useable. I also prefer the local control model, though the remote control model may suit some installations. I have modified remote models to local control, but it is quite an undertaking.

The basic radio will accommodate up to three oscillator stages/channels on each of the receive and exciter board, although components may be fitted for only one. Extra channel components are normally supplied as a kit, though most components are standard except the "frequency

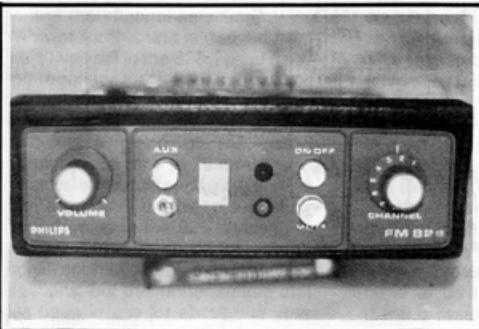
adjust" coil in series with the crystal and the sleeves used as the crystal socket. Hopefully you can find a suitable former and core and wind the few turns required for the coil, duplicating the turns as per the existing coils. Be warned that the RX and TX coils are not the same. The crystal socket sleeves look like elongated blind eyelets. I have seen suitable crystal sockets in CB radios, maybe a standard eyelet would be suitable, or the crystal soldered directly into the board.

So you will have three simplex or duplex channels available once you have achieved the above. Should you require more channels, there is an accessory board available which accommodates seven more TX and RX oscillator stages, bringing the total to 10 channels. If you are not able to acquire that board, it would be possible to duplicate the number of oscillator stages required on a piece of vero-board.

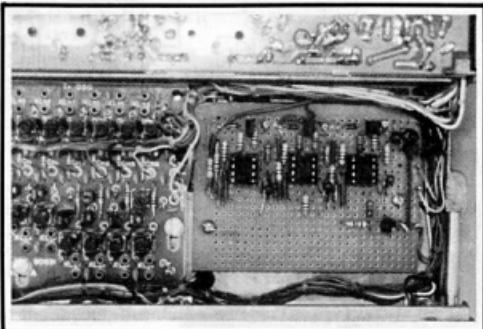
Manufacturer's information

It will be necessary to obtain a copy of the tuning instructions and the schematic (if not the complete) service manual. Your local two-way radio dealer may be able to help in this regard.

From the schematic you will see how each oscillator stage is switched to select channels by earthing the emitter of each of the respective RX and TX oscillators. Should you start with a single channel radio, this switch probably will not be fitted as, of course, it is not required. The two channel radios I have seen have had a two-position slide-type switch fitted.



Modified front panel of the Philips FM828 showing the scanning switch.



The modifications on Veroboard installed inside the FM 828.

The multi-channel types have a rotary switch which can accommodate the 10-channel maximum if required. Naturally, if you require more than two channels, it is easier to try to locate a radio with this type of switch already fitted. You can then switch channels manually, which makes the initial tuning easier and, indeed, I have left this switch fitted to enable manual selection of channels even though the radio has been modified for auto-scan.

Number of channels

The above information should give some overview of the 828 before commencing the modification. I decided to scan three channels and have utilised fairly basic circuitry. I think this approach may be suitable for up to, say, four channels, but could become unwieldy both electrically and physically above this number. Should you wish to scan a greater number of channels, a different technique such as a 555 clock driving a 4017 or 4022 counter IC may be more practical.

Referring to the schematic diagram, you will note the 555 timers in the monostable mode are cascaded in a ring circuit to provide

the required sequential channel switching. The resistor/capacitor combination on pins 6 and 7 govern the scanning speed . . . the values specified give about one second per channel. The reason for the lower supply voltage to the 555s is to enable the timers to be "stopped" with the application of the higher voltage on pin 5 (control) once a receive channel becomes active. The carrier detect signal from pin 13 of the 828 RX board via an inverter, Q4 (PNP) is applied to that pin 5 of each 555 to stop and hold the scan while a receive channel is active. The scan will recommence once that receive channel is free.

The switching signal from each 555 drives a transistor inverter which in turn is used to switch on the respective pair of the radio's oscillator stages. The LEDs and associated series resistors, shown dotted in the schematic, are invaluable in debugging the timers. When these timers are operating correctly, the LEDs will light in sequence with each activated channel. They could, in fact, be mounted on the front panel of the radio to indicate the channel number, or frequency, that is currently being scanned or selected.

Indication

In fact, the above is really the easiest method of channel indication. I decided to press on and use a 13mm common anode seven segment display which was mounted on a small piece of vero-board. This vero-board was also used to mount a number of diodes to select, brute-force wise, the required segments of the display for each channel . . . one to three. Here again, if you wish to indicate more than, say, four channels, this approach becomes unwieldy, and a display driver IC would be a more elegant solution. Fitting that indicator assembly in the front panel of the 828 and keeping the rear of the assembly clear of the chassis casting that divides the RX and TX boards proved to be a major exercise, due to the limited space available. However, the result is somewhat more pleasing than I imagine the LED indicator system would be.

I fitted a double pole double throw switch (DSE Cat P-7684) to the front panel. This switch is spring loaded from one side, centre off and a normal switch position on the other side. These positions are labelled "start scan", "scan" and "manual".

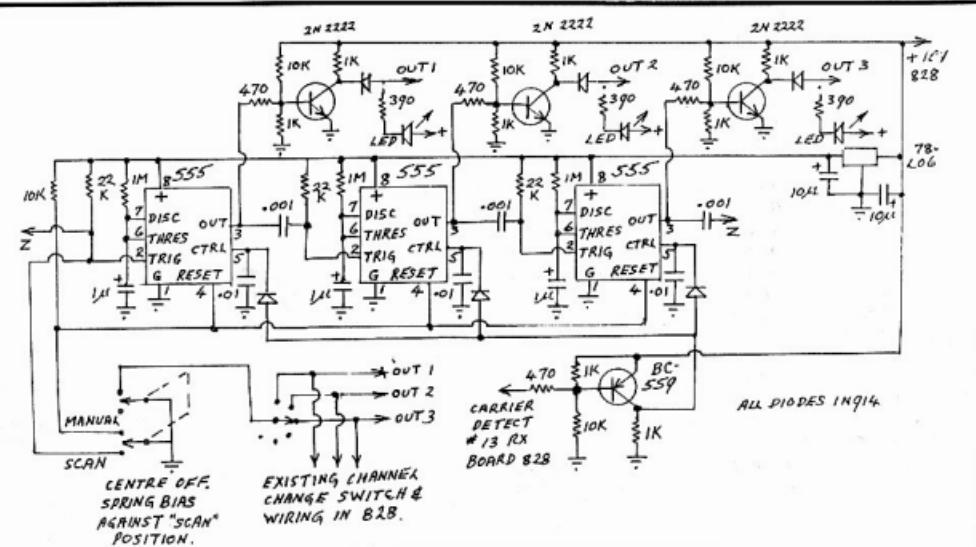


Figure 1 — 828 Auto Scan Schematic (VK4BRG).

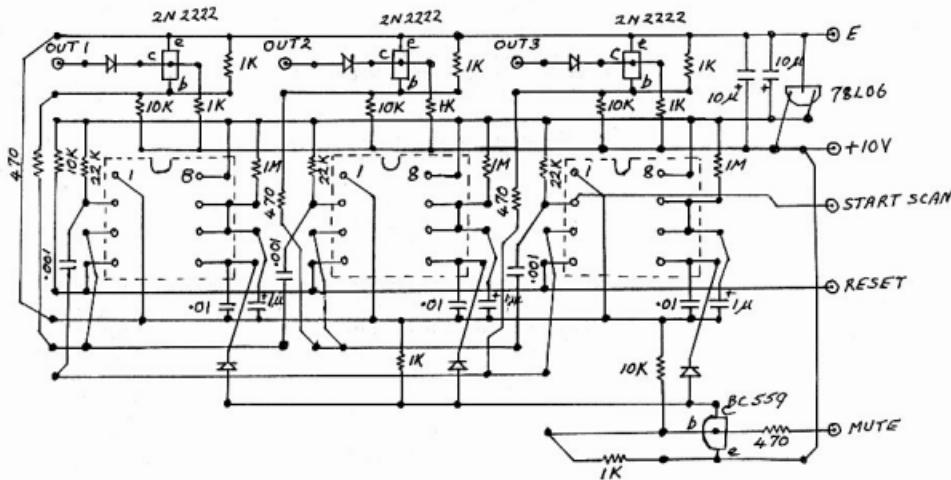


Figure 2 — 828 Auto Scan Layout (VK4BRG).

respectively. From the schematic you will notice that pin 2 of one 555 is switched to earth with the spring loaded section. This is necessary to initially manually trigger the scan circuit. (One could possibly arrange for this to be done automatically at switch on). The manual position of the switch leaves the radio's rotary channel change switch connected normally (to enable manual channel selection) and also inhibits the operation of the 555s by grounding the reset line. The centre off (scan) position disconnects the rotary switch and allows the scanning circuits to control the channel selection.

Power for this unit is derived from the 10-volt rail in the 828. I used a six-volt regulator for the 555s; however, the more common five-volt regulator should be satisfactory. The unit is built on a piece of vero-board measuring 60 mm x 75 mm and is mounted on spacers with 6BA screws into a couple of the pre-existing tapped holes in the 828 chassis.

There is obvious scope for utilising more sophisticated circuitry and functions, but this rather simple unit has been in use for about one year and prove quite satisfactory. The relatively slow scanning rate currently

used could be accelerated somewhat, as I think some very short calls are missed.

Some notes on vero-board layout/construction

1. The scale used is 3x full size.
2. All horizontal lines on 0.1 grid are vero-board tracks.
3. The link in the start/stop scan circuit is on the track side of the board.
4. All vertical links are on the component side of the board.
5. Some of these links, together with some component leads, will need to be insulated with heatproof sleeving where the possibility of shorting may occur.
6. The links to pin 1 of the 555s are fitted prior to fitting the IC sockets.
7. Take particular note of where the vero-board tracks need to be cut. In most instances there is a vero-board hole between the ends of the tracks. I used this hole as a guide for a sharp 5/32 drill to cut tracks. One suggestion would be to photocopy the layout and mark with a cross where the tracks need to be cut. I tried to mark these crosses on the layout, but the extra detail cluttered the layout.

8. Matrix board pins are used for external connections, marked as a dot with a small concentric circle.
9. Soldered connections are marked with a dot.
10. Actual specific details/dimensions of mounting the board, toggle switch and channel indicating system is left to the individual constructor due to the possible variations involved. The size of the board given will fit together with the multi-channel board; however, there is then no room for the internal speaker.

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**Help stamp out
stolen equipment
— keep a record
of all your
equipment serial
numbers in a
safe place.**

AMSAT Australia

Bill Magnusson VK3JT *

Over-the-horizon DX through the RS satellites

Reports have been coming to hand, mainly from Europe on the subject of working quite extraordinary distances via the RS series satellites. When mode KA is operating there are alternate uplinks available on 2 metres and 15 metres. Even though the 2 metres path to the satellite disappears almost immediately it goes over the horizon, it seems that the 15 and 10 metres propagation can carry on over much longer distances. This is going to depend heavily on prevailing ionospheric conditions of course. The satellites are skimming around just outside the ionosphere. Low angle refraction, ducting and other effects can account for such propagation. Back in November 1974 P L Dyson of LaTrobe University, Melbourne described experimental evidence of these effects using data from the OGO-6 and ISIS-1 and 2 satellites in the Proceedings of the IREE. This report contained some rather surprising revelations, one of which was that the region of space where many low-earth-orbiting satellites are located can quite properly be considered to be part of the ionosphere. Dyson (and others) claim that F layer irregularities can extend for large distances along the earth's magnetic field lines and to quote Dyson, "When the satellite is within one of these irregularities radio pulses transmitted by the sounder can be trapped by the irregularity and guided or ducted from one side of the earth to the other". Reports from Europe suggest that inter-continental contacts are regularly made over the north pole between Europe and America. I wonder if any RS satellite operators in our part of the world have tried this mode. It sounds very interesting. I can't work it myself due to a rather high noise level at this QTH so I'd like to hear from anyone who can give some details of contacts made from VK via this mode. Claims have been made of contacts having taken place through 2 satellites "in series" to even further extend the range. This would be a rare occurrence as the likelihood of co-visibility at the right time is remote. Remember that normal terrestrial origin signals can be heard in the RS pass-bands so you will need to verify that you are actually hearing signals from RS by listening for the beacon or transponding a signal through the satellite.

A new approach to squint angle measurement

Well known satellite guru, James Miller G3RUH has done it again. James has come up with a method of determining the squint angle, (the Americans call it off-pointing angle) using directly observable data obtainable from the satellite at any time. It relies on the satellite antenna being mounted slightly off centre to the axis of spin. It is normal for at least one antenna to be so mounted. Rotation will cause very small but measurable phase differences in the received signal. James has devised a method of resolving the data to give a very

accurate read-out of squint angle which is independent of the usual sun and horizon sensors. These sensors are sometimes unusable for long periods due to eclipses and sun blinding. This development occurred at a most fortuitous time when eclipses were indeed affecting the readings during a recent reorienting of AO-13's attitude. A full account of this important development appears in the Feb '93 issue of "Oscar News" from AMSAT-UK. It's well worth reading.

AMSAT National co-ordinator

Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:

Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)

Primary 7.064 MHz. (Usually during summer).
Secondary 3.685 MHz. (Usually during winter).

Frequencies +/- 5 kHz for QRM.

AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$25 for Australia, \$30 for New Zealand and \$35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Arsene up-date

At the time of printing the best information to hand regarding the launch of Arsene indicates a launch on or about 20th April 1993. The orbit will be high altitude, slightly elliptical and most importantly, equatorial. What does this all mean? Well, it will be the first satellite of the phase 3 family which will be equally useable for stations in BOTH hemispheres and will provide long periods of good inter-hemisphere DX each orbit. With an apogee of about 36 000 km and a perigee of about 20 000 km it will exhibit a sky-track unlike any previous amateur radio satellite. With three axis stabilisation it should offer excellent squint angles to all users even at perigee. Available launch opportunities have so far restricted the orbits of the phase 3 birds to high inclination, highly elliptical orbits. Other factors such as radiation susceptibility and power budget also come into orbit selection. These orbits have heavily favoured one hemisphere or the other, (usually the heavily populated northern hemisphere). In the August 1992 column I gave a set of "keps" to allow you to model the orbit. Put them into your favourite tracking program and have a look. If the launch goes according to plan I'll devote the column next month to a complete run-down on this satellite.

MIR crew change

The new crew on board MIR seem to have settled in nicely and amateur radio operations have become a regular part of their routine. Some initial problems with the TNC and software have all been resolved and regular packet and voice operation has been observed.

The new crew are: U9MIR Gennady Manakov R2MIR Aleksandr Poleschuk

They are due to return in late July 1993, to be replaced by:

R3MIR Vasily Zibliev

R4MIR Aleksandr Serebryov, who will remain on board until late November 1993.

AMSAT-UK satellite frequency guide

I received a parcel by post recently from Ron Broadbent G3AAJ of AMSAT-UK. He had read of my intention to publish the frequency list in last month's column. Ron sent me a copy of their "Satellite Frequency Guide". It is a very complete and up-to-date list of all transponders and beacons. Available in clear plastic from AMSAT-UK at 2 pounds 45 p Sterling posted to VK personalised with your name or call-sign. The address for all communication with AMSAT-UK is 94 Herongate Rd, London E12 5EQ.

Software Review

Many satellite operators rely heavily on packet radio for vital operating data, eg latest news, keps etc. I've recently been testing a new piece of packet terminal software called TPX. It works in conjunction with the F6FB bulletin boards to make your station virtually fully automatic. You can select the information you require and it is automatically down-loaded into your system. All automatic up-loads and down-loads are done in compressed form thus saving considerable channel time. A major attraction of this software is that it does a lot of its work in un-connected mode. To this extent it works rather like the broadcast protocol operating on OU-22. The software is available from the Melbourne Packet Radio Group Inc and is well worth a look.

AO-13 report

At the time of writing we are coming into a period of good long DX windows from VK to Europe and North America. The recent (and on-going) eclipses have disrupted the schedule but Graham, James and Peter have done a remarkable job in juggling the attitude to give the best possible operating opportunities consistent with a safe power budget. Take advantage of these good conditions while you can. Indications are that the predicted demise of AO-13 due to eccentricity perturbations is only 2 or 3 years away. During that time however we should see many repeats of these good DX conditions.

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Packet: VK3JT@VK3BBS

How's DX

Stephen Pali VK2PS *

In November last year I asked you to voice your opinion about the proposed space cuts to this column by the production editor. Over the three months following, a total of 23 letters and faxes arrived at my desk; also a few phone calls. All those readers who took the trouble to put pen to paper were very supportive of this column; none of them wanted to be cut. Some of them suggested certain alterations to the presentation. For your information the number of readers from each Division who responded is as follows: VK2 = 6, VK3 = 4, VK4 = 4, VK5 = 6, VK6 = 1, VK8 = 2. There was no reaction from VKs 1, 7 and 9. Five of the letters came from "closet DXers" of whom I never heard, worked or read about before.

The copies of your letters were sent to the management of AR (publisher, editor, production editor and federal media officer), with a five-page submission on my part which essentially suggested that a minimum of two pages to a maximum of three pages should be allowed for the "How's DX?" column in each issue. Mr Bill Roper VK3ARZ, who is the official publisher of the magazine and general manager and secretary of the WIA, in a letter to me dated 23 February, said this, among other things: "I will ensure the editors make every effort to allow you an average of two pages per month."

The matter rests here. Thank you — all of you — for your loyal support. I will acknowledge your letters and thank you individually by replying in the coming weeks.

Spratly Islands — 9MOS

News of this DXpedition came too late to be included in the March issue of AR. This expedition was to have taken place between 11-17 March. The island group is located in the South China Sea and it is a very much disputed territory. Some of the individual islands are claimed and occupied from time to time by the military from the People's Republic of China, Vietnam, the Philippines, Malaysia and Taiwan. It is rumoured the islands and the immediate waters around them are rich in oil, which would partly explain their dangerous nature. Small skirmishes between warring parties made the islands not only dangerous, but also made them one of the most sought-after countries in the DXCC "most wanted" list. Eleven amateurs from five countries were to operate as 9MOS from Pulau Layang Layang Island, which is located about 165 miles north-west of Labuan Island on the west coast of Sabah. The island was previously known as Swallow Reef. The Malaysian Royal Navy will provide the necessary escort and protection for the 45m MV Coral Topaz which will carry the expeditioners. QSL cards go via INDEXA c/o W4FRU, John Parrott, PO Box 5127, Suffolk, UK 23435, USA.

News from the DX Advisory Committee (DXAC)

The DX Advisory Committee (DXAC) of the ARRL has voted on, or recommended on, the following matters:

- Recommended that the Red Sea Islands (Abu Ali-A15) be deleted from the DXCC Countries list effective 31 March 1991.
- The Committee will submit an operating ethics report to the ARRL. This report is the result of the "disqualification criteria" request following the 3Y5B Bouvet operation.
- Recommended that the Temburong District part of Brunei Darussalam (V85) be not declared as a separate DXCC country.
- Discussed possible changes in the DXCC list for future ballots regarding: Mount Athos (deletion); Eritrea (new country or reinstatement to the existing DXCC list). A popular vote on the question of political independence from Ethiopia will take place in April 1993. The DXAC awaits the result of that vote before it votes on the DXCC status of Eritrea.
- Deletion of ex-Czechoslovakia and adding to the list the new Czech Republic and Slovakia.
- The DXAC is seeking world-wide input on suggested DXCC rules changes that would discourage abuses of the QSLing process. Interested parties may submit examples of poor QSLing practices and suggested changes until 31 August 1993. Any change in the rules must be fair, enforceable and not to place burden on the ARRL, the DXCC desk or the DXing community. Make your submission to the DXAC c/o ARRL, 225 Main St, Newington, CT 06111, USA.

"... DXCC rules changes that would discourage abuses of the QSLing process."

QSLing practices

There is quite a considerable debate going on at the moment on QSLing practices in the various DX bulletins and magazines. Even the DXAC is asking for submissions on this question. The controversy has been simmering for many years, but came to the boil by the almost total collapse of the safe mail delivery system in certain countries.

Subjects discussed were:

lost or pilfered mail, or total destruction of mail;

missing IRCs or missing "green stamps"; alleged dishonesty of some QSL managers; the high cost of postage in some European countries, Germany and Austria being the case in point;

the DXCC being blamed that it requires the submission of original cards for its award program.

But before you, the average DXer, start to

complain of not getting the card, let's revise the short rules which should apply when QSLing directly to foreign countries.

1. If you think your own mail system is not working, be assured there are many more countries in the world where the mail system is worse, or very much worse and unsafe.
2. Use return envelopes which will fit flat, without being folded, into the envelope addressed to the DX station or QSL manager.
3. Check the QSLing address several times. A misprint or a wrong post office box number will never produce a reply card.
4. Never put any callsign or similar designation "to amateur radio station Joe Blow" on the envelope, never use your own callsign as a sender on the envelope. Some naive amateurs use rubber stamps showing full callsign and amateur radio station on reply envelopes. Open invitation to pilferage.
5. If possible, use a typewriter when addressing the envelope. Use longish type envelopes so they appear as business mail.
6. Use envelopes one cannot see through — even when you hold a light against the envelope.
7. Never use postage stamps if you can avoid it. Use printed labels issued by the bigger post offices throughout Australia. Letters will be pilfered even for the value of the used postage stamps to stamp collectors, to whom these will be sold.
8. Never use sticky tape for additional sealant on letters. Instead use good synthetic glue if you think the original glue will give way to "hot vapour" treatment.
9. If you are sending letters to PO boxes and do not know the name of the boxholder, address your letter to "The Manager", and follow with the box number etc.
10. Remember, in some countries it is illegal to receive money (green stamps) through the mail. Again, in some countries, IRCs are of no use because the country is not a subscriber to the Universal Postal Union.
11. Make sure your QSL cards show the correct UTC date (not the local day/date) and the correct UTC time (not your local time), otherwise the card will be returned to you "not in the log".
12. When you QSL direct, whether within Australia or overseas, always include a return self-addressed and stamped envelope (for overseas mail enclose one IRC or one \$US, depending on the information received). Remember, QSL managers are doing voluntary work, and are not rich people. The odd additional green stamp or IRC you might send covers the postage for those who, because of ignorance, do not enclose return postage, but expect direct reply.

Incidentally the full name of IRC is: International Reply Coupon issued by the UPU (Universal Postal Union) and sold by your local post office. The coupon is exchangeable in any country of the Universal Postal Union for one or more postage stamps representing the minimum postage for a priority item or an unregistered letter sent by air to a foreign country.

Future DX activity

- Norm ZL1ST advises that Zenon OD/SP7LSE is with the UN Forces at Naquora in South Lebanon, and will be there at least until 30 August; maybe even until 30 December. Zenon is keen to work VK-ZL-South Pacific stations on 10-80m, both in CW and SSB. QSLs go to SP7EJS Antoni Lichota, PO Box 82, 96-1000 Skiermiewice 1, Poland.
- Francis FT5YE is located on the French Antarctic base Dumont d'Urville (66 deg S and 140 deg E. Petrel Island, IOTA AN 017). He will be active until the end of the year. Some of us had worked Francis under his former callsign FT4XG when he was on Kerguelen Island.
- Mohammad EP2MHB can be found on the European DX Net (14243 at 0600 UTC on Saturdays). His QSL address is Mohammad H Bahrololoom, PO Box 16765-154, Tehran, Iran.
- There is a rumour floating around that Mellish Reef will be activated this year, possibly by an Australian DXer.
- International Marconi Day will be held on 24 April 1993. Approximately 22 international stations have indicated they will take part, having a suffix combination which will include some or all the three letters of IMD in their suffix. A handsome award is available from the Cornish Radio Amateur Club if you work 12 of the active stations.
- SODBA can be heard on the lower end of the 14MHz SSB band in the early hours of our morning (2000 UTC).
- ZD8DEZ will be active from February to August this year.

Interesting QSOs and QSL Information

- VP2VE-14MHz-1122-Feb. QSL to WA2NHA Howard Messing, 90 Nellis Drive, Wayne, New Jersey 07470, USA.
- VP5P-14012-CW-2145-Feb. QSL to WB3DNA Timothy R Fanus, 6140 Chambers Hill Road, Harrisburg, PA 17111, USA.
- T21XO-21006-CW-0600-Jan. QSL to The Manager, PO Box 73, Berlin 1020, Germany.
- VP2MEG-Keith-14236-SSB-1132-Feb. QSL to WB2LCH Gene W Ege Sr, PO Box 64, Gloucester, NJ 08030-0064, USA.
- KE6BLT-Brian-14236-SSB-1127-Feb. QSL to K2GX Joseph M Sand, 45 46th Street, Woodside, NY 11377, USA.
- FT5YE-Francis-14152-SSB-1133-Feb. QSL to F1AAS Francis Saugeron, Gauric, F-33710-Bourg Sur Gironde, France.
- XU-OUUN-Ross-14236-SSB-1130-Feb. QSL to VK3OT Steve Gregory, PO Box 622, Hamilton, Victoria 3300.
- 9J2GA-George-21205-SSB-0516-Feb. QSL to George Ada, 56 Datura Av, Luanshya, Zambia, Africa.
- 4N5CN-Jane-1422-SB-0626-Feb. QSL to Jane Atanasov, Box 73, Kocani, 92300, Republic of Macedonia.
- 3X0HNU/P-14222-SSB-0550-Feb. QSL to F6NU Antoin Baldeck, BP14, F-91291, Arpajon, Cedex, France.
- 9Y4AL-Tony-14165-SSB-2131-Feb. QSL to Anthony Lee Mack, 62 Alexander Road, Vista Bella, San Fernando, Trinidad.

From here and there and everywhere

- If you have not worked Lionel VK9CB yet, the reason is that Lionel is enjoying his extended holiday doing a bit of fishing on Cocos-Keeling. He writes in his letter to me: "I do not want to pose as someone on an expedition. I am not. I operated here in 1960, and again in mid-1992, and now since early in December." At the time of his letter (December) he was still waiting on his beam from the mainland. At that time he had wire antennas strung over the top of two coconut palms. He promised more activity before he goes back to Western Australia. QSL to his home call: VK6LA Lionel Allen, 189 Lockhard St, South Como, WA 6152.
- When sending cards directly to the Baltic States, Estonia=ES, Latvia=YL, Lithuania=LY, it will speed up and make delivery safer if you mark the envelope "via Finland" or via Sweden.
- News from Albania. The ZA1 T-series call will be replaced with one-letter suffixes. Another 11 such calls were issued after a recent examination. The total number of resident operators in Albania is now 23.
- Ken VK5QW advises that Peter KH6HBZ, who is now in Somalia (see Feb AR) is a surgeon attached to the US Marine Corps. He was to be in Somalia till the end of February. His QSL manager is K4YMQ Ira Franklin, 1316 Colonial Way, Alabaster, AL35007, USA.
- I like the rubber stamp on the front of N7MUX/DU4's reply envelope, which says "Contains no cash, cheques or anything of value".
- Brian C21BR returned to New Zealand on 19 February, much earlier than the anticipated date in April (see March AR).
- Ken has changed his V73CT callsign to V73C. His QSL manager is still AH9C.
- New regulations in the People's Republic of China have allowed some amateurs to operate from home. The distinctive prefixes of BA, BC and BG will designate such elevated and trusted status.
- The AH1A team had stopped transmitting on 4 February, but stayed on Howland Island until 10 February. High winds and high surf made boarding their ship, "Machias", extremely difficult and dangerous. They arrived back in Hawaii on 15 February.
- The ET3YU operator very proudly calls himself "pirate radio ET3YU" on his QSL card. He operates from Ethiopia, but it appears he is not licensed. Save your energy and money.
- Romeo 3W3RR has personally delivered the documentation for the PSRS7 activity to the DXCC desk of the ARRL. It appears the decision of accepting the North Korean activity will not be made before 30 March. The QSL cards for PSRS7 are being printed now. QSL manager: JA1HGY Nao Mashita, 8-2-4, Akasaka, Minato, Tokyo, Japan.
- The starting date of the ARRL 5BDXCC award has been changed to 15 November 1945.
- According to Steve Gregory VK3OT, QSL manager for XUOUN, not all stations operating under the United Nations

Transitional Authority in Cambodia are licensed. I was shown a photocopy of a Cambodian licence on which I could recognise the callsign as XUOUN, and the words VHF, HF and WARC, and a reference number as JC4889414G.

- TZ6RM will return from Mali to the US at the end of April.
- At the end of February, amateur radio stations in Kuwait had an NLD suffix attached to their full callsign, indicating the celebrations on the occasion of the National Liberation Day of Kuwait.
- Chatham Island ZL7AA and a number of individual ZL7 callsigns showed up on various bands as predicted, on the first day of March.

QSLs received

From managers: VK9LD (VK4CRR 1W) — VK9NE (VK9NS 4W) — CYONSM (VE1CBK 12W) — HZ7TA (OE6EEG 10W) — XUOUN (VK3OT 1W) — VI4RUM (VK4GAT 4W) — From bureau: VK8SEA (8W).

Thank you

This column would not have been possible without the input of the following contributors: VK2KFU, VK3DVT, VK3OT, VK4DA, VK4OH, VK4OD, VK5QW, VK6RO, VK9CB, DL6ZFQ, HL9HH, ZL1ST, and the following publications: ORZ DX, the DX Bulletin, and the DX News Sheet.

Good DX and 73

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On Operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S." -AR
"I found the FT-1000 easier to learn and use than any other radio in its class." -QST

On Documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos". -QST
"The quality of printing and presentation of this book is the best I have seen..." -AR

On the Receiver

"...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." -QST*

"The direct digital synthesizer works very well and produces receiver performance that sets new standards." -AR

"I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation..." -ARA

Transmitter - SSB

"The FT-1000 is easy to adjust and use.... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." -QST

"Reports were all very favourable, especially when using the speech processor." -AR

Transmitter - CW

"CW keying was a delight... power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." -AR

"On CW the FT-1000 was absolutely faultless." -ARA

"CW operation with the internal keyer is a breeze..." -QST.

Transmitter - RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." -PW
"Packet and RTTY modes were tried and proved just superb." -ARA

Conclusion

"...the FT-1000 represents unbelievable value..." -AR
"It's an excellent set worthy of accolades and rave." -ARA
"...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." -QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver and easy to use controls put it far ahead of the competition. Hurry in today and check out our limited number of ex-demo models all with a full 2 year warranty. Wouldn't you rather be using the 'Best of the Best'?

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ARA - Amateur Radio Action Vol.13, No.2

AR - Amateur Radio August 1990

P.W. - Practical Wireless January 1990

QST - ARRL QST March 1991 ("review with optional filters fitted")
Copies of our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105

Some models may be shop soiled. However all come with a full 2 year warranty.

*Ex demo units are available at these stores: Please phone to check availability. York St (02) 267 9111, Nth Ryde (02) 878 3855, Chermside (07) 359 6255, Brisbane City (07) 229 9377, Springvale (03) 547 0522, Coburg (03) 383 4455, Bourke St (03) 639 0396, Adelaide (08) 232 1200, Perth City (09) 328 6944

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The FT-212RH is a compact mobile FM transceiver that can also double as an easy-to-use base station. Provides 45-watt output over the 144-148MHz range, with a rugged diecast chassis for superb RF isolation and extensive use of surface-mount components for greater reliability. What's more, it has a large back-lit LCD with bargraph PDS-meter, 5 selectable tuning steps and a total of 21 memories (18 general purpose, 1 call channel and 2 sub-band limit memories for band scanning). As well, there's built-in C.T.C.S.S. encode and a variety of scanning functions. Complete with mobile mounting bracket, MH-14A8 hand microphone and DC power lead.

Cat D-3494

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FT-747GX COMPACT H.F TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual operator-selectable tuning steps for each mode, dual VFO's for split-frequency operation, and 20 memory channels (eighteen of which can store split Tx/Rx frequencies). Wideband 6kHz AM and narrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.

Cat D-2930

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RMK-747 remote front-panel mounting kit for the FT-747GX is now available. Great for HF mobile operation where space for a full-size rig is limited. See ARA review volume 15, No. 7. Cat D-2931

(Includes installation on your FT-747GX) **\$450**



AC version FT-990

Cat D-3260

\$3495

DC version FT-990

(upgradeable to AC version)

Cat D-3255

\$3195

2 Year Warranty

FT-990 H.F ALL-MODE BASE TRANSCEIVER

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM) with the internal AC power supply allowing high duty cycle transmissions. An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 500Hz B/W CW filter, 90 memories and one-touch band selection. Microphone optional extra.

RUGGED HF 5-BAND TRAP VERTICAL ANTENNA

The tradition continues! The 5BTv is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5 band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low loss windings), for accurate trap resonance with 1kW(PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m or less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands.

High strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless steel clamps and hardware guarantee a longer life. At just 7.65m, the 5BTv can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs the 5BTv can be fed with any length of 50 ohm coax cable.

Cat D-4920

\$329

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30m RESONATOR KIT

Adds 30m coverage and includes all hardware.
Cat D-4921

\$89.95

VRK-1 RADIAL KIT

Provides a 5-band ground-plane for above ground antenna mounting positions.
Cat D-4922

\$69.95

DIAMOND D-130J DISCONE ANTENNA

This quality Japanese disccone antenna covers the frequency range 25-1300MHz and is easy to assemble and install. With extensive aluminium and stainless steel construction it's extremely durable, while allowing transmission on the 6m, 2m, 70cm and 23cm bands with a maximum power rating of 200W PEP. Complete with most mounting hardware, stainless steel U-bolts and instructions.
Cat D-4840

\$169

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We carry a wide selection of high quality vertically polarised base station antennas to suit most VHF/UHF Amateur applications. Each antenna was chosen based on its tested performance, reliability, construction quality and value for money, so you can be confident they'll work well the first time and last for years. Brands supported include Diamond and Brainer from Japan, as well as an excellent Australian made Mobile One product.

a) HIGH PERFORMANCE VHF/UHF BASE STATION ANTENNAS

These antennas from Diamond and Brainer are all of a stacked colinear type which provide high gain, wide bandwidth and a low radiation angle for extended range base station operation. Each antenna uses a jointed F-R-P (fibreglass reinforced polyester) outer tubing radome with gasket seals to ensure excellent all weather operation, and is supplied with compact ground-plane radials for a clean radiation pattern. Corrosion resistant stainless steel mounting hardware is also supplied. Brainer antennas are made by Dick Smith Electronics and feature detailed locally written instruction sheets. Both brands are covered by a 1 year warranty.

2m ANTENNA F-23A

Frequency: 144-148MHz
Gain: 7.8dB
Max Power: 200W
Length: 4.53m
Type: 3 x ½" colinear
Connector: SO-239
Cat D-4850



\$239

2m/70cm ANTENNA GST-1

Frequency: 144-148MHz,
430-440MHz
Gain: 6.0dB(2m), 8.0dB (70cm)
Max Pwr: 200W
Length: 2.6m
Type: 2 x ½" colinear (2m),
4 x ½" colinear (70cm)
Cat D-4830



\$199

23cm ANTENNA F-1230A

Frequency: 1260-1300MHz
Gain: 13.5dBi
Max Power: 100W
Length: 3.06m
Type: 25 x ½" colinear
Connector: N-type
Cat D-4870



\$299

2m/70cm ANTENNA GST-3

Frequency: 144-148MHz,
430-440MHz
Gain: 7.9dB (2m),
11.7dB (70cm)
Max Power: 200W
Length: 4.4m
Type: 3 x ½" colinear (2m),
7 x ½" colinear (70cm)
Connector: SO-239
Cat D-4835



\$279

b) ECONOMY 2m BASE STATION ANTENNA

An outstanding value-for-money, compact ½ wave Australian-made 2m base station antenna which is only 1.69m long. It uses a single section F-R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.15:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection.
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5 Year Warranty

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STORES ACROSS AUSTRALIA AND NEW ZEALAND

Divisional Notes

Forward Bias — News from the VK1 Division

Christopher Davis VK1DO

At our annual general meeting in February, the following members were elected to office:

President — Christopher VK1DO, Treasurer — Don VK1DH, Secretary — Hugh VK1YYZ, Senior Vice President — Rob VK1KRA, Junior Vice President — Dick VK1KRE.

Committee members elected were : Paul VK1BX, Rob VK1KRM, Keith VK1ZGW, Ian VK1BG, Michael VK2ZGU.

Our April meeting will be held on Monday 26th April 1993, commencing at 8.00pm in the studio room of the Griffin Centre Canberra City. Our guest speaker will be Wing Commander Keith McPherson, the Project Manager Space and Joint System Headquarters ADF. His technical presentation will be on Global Positioning Systems, better known as GPS. These state of the art devices combine many of the technologies pertaining to our hobby, namely low earth orbit satellites, and microprocessor technology.

As well as the presentation of GPS systems at our April meeting, we would like our members to participate in a survey to determine preferences for broadcast times, and the provisions of other member services.

Members please take note of the dates for the remaining 1993 meetings. Each meeting is held on the fourth Monday of each month: 17th May, 28th June, 26th July, 23rd August, 27th September, 25th October, 22nd November.

VK2 Notes

Tim Mills VK2ZTM

Annual General Meeting

Members of the WIA NSW Division are advised that the 1992/93 AGM will be held at Amateur Radio House, 109 Wigram Street, Parramatta on Sunday 9 May 1993 at 2pm. The business paper, annual reports, membership cards, QSL Bureau registration and other material for this meeting are an insert to this issue of Amateur Radio.

Bob Lloyd-Jones VK2YEL, Secretary
The AGM is being held a week later than previously intended due to a clash with the Federal AGM. Proxies for the meeting have to be lodged at the office by 10am on the day of the meeting. There are some changes being introduced in the VK2 QSL Bureau. Notice has been given already via the VK2WI broadcasts. All intending to collect cards via the Bureau have to keep a current notification with the Division. A card may be with the annual report to enable you to update this information. A report in later VK2 notes.

The next exam conducted by the Division will be at Parramatta on Sunday 23 May. Applications close 6 May. Contact the office. The next Trash and Treasure is on Sunday 30 May. The annual Urunga Convention — naturally at Urunga on the VK2 north coast — over Easter. The Parramatta office has no more 1993 callbooks. (Publisher's Note: The WIA Federal Office has a limited supply of 1993 Call Books still available.)

Pagers/repeaters

Other call areas with more gentle terrain may not have the concentration of paging transmitters needed in parts of VK2. Much of the published material to date seems to infer that the amateur has to live with and take whatever action is practical to cleanse one's receiver of pager "noises". An area that is not being addressed in the discussion to date is the ability of some pairs of pager systems to preform — somewhere — a 2a-b mix of their fundamental frequencies, and one of the resulting mixes is appearing near 147.148MHz repeater inputs. Some of these signals originate tens of kilometres from the site of the repeater being affected.

Often the offending pager site/s can be easily identified, and retuning or other action at the site with the equipment often reduces or eliminates the mix. However, these sometimes recur or other systems/sites get into the act. Systems affected at the moment include VK2RGL Bulahdelah 7375; VK2RTS Springwood 7300 and VK2RIL Wollongong 7275. NTAC is currently reviewing the matter and welcomes any written material to the VK2 office via the contact methods detailed in AR's page 3 directory.

Matters before the NTAC committee at the moment include the pager problem noted above, and ATV channel allocations. Applications received recently for changes or new systems include several additional systems from six metres and up for the Goulburn ARS. Tamworth wishes to relocate its

VK2RMO on Ch 7275 from near Tamworth to Narrabri. The North Shore RC seeks to establish a 70cm repeater in Sydney. The Newcastle UHF and ATV club wishes to change channel on its ATV repeater VK2RTN, now a Ch 35 has become operational in Newcastle. They seek a 1250MHz FM input, and a 444.25MHz VSB output. Site remains at New Lambton.

Groups in VK2 seeking changes or new systems are reminded that the procedure is outlined on page 27 of the 1993 Australian Callbook. To assist with processing you should first obtain a set of the paperwork from the office. Applications/changes are processed by NTAC and passed to Divisional Council for their action and forwarding to the State DoT/C office.

VK2WI

A frequency change has been performed on the 2m SSB broadcast transmitter; it is now on 144.150MHz. Some work is being done by way of additional antennas to allow some of the VK2RSY beacons to remain on for most of the broadcast period. Up till now the beacons and SSB transmitters have shared common antennas. In the long term, both services will have new and relocated antennas further from the ground to see over the continued tree growth.

VI150SYD

Stephen Pali VK2PS, WIA NSW Division, Special Projects Officer

Statistics of the special event station VI150SYD activity 1 January 1992-31 December 1992. This list of clubs and individuals is not in any particular order.

Name of club, callsign of participating operators — if known — and number of contacts made.

VK2 New Members

The following are recent new members in the VK2 Division. Our usual warm welcome to them.

GR (Robert)	Barker	VK2TSR	Greystanes
P (Prabhakar)	Bhat	Assoc	Toongabbie
J	Brand	VK2NQ	Strathfield
CL	Croney	VK2CLC	Kogarah
KJ (Kenneth)	Draper	VK2VVV	The Entrance
C (Craig)	Flanagan	Assoc	Newcastle
BS	Furby	VK2XNZ	Campsie
DJ (David)	Gardiner	VK2KDG	North Nowra
JJ (John)	Gerhard	VK2TH	Wagga Wagga
FW (Frank)	Gross	Assoc	Nowra
BH (Brian)	Halpin	VK2BVH	Miranda
GM (Greg)	Hammond	VK2YKI	Lindfield
KM	Hawkins	VK2GXB	Tumbi Umbi
GA (Gerard)	Hill	VK2DAA	Castle Hill
A (Adrian)	Johnston	VK2TBG	Forestville
P (Patrick)	Johnston	Assoc	Kellyville
DJ (Darryl)	Jones	VK2YDJ	Lemon Tree Passage
SW (Shaughan)	Linton	VK2DSL	Ballina
DJ	Martin	Assoc	Toongabbie
D (Dennis)	Phillips	VK2GWA	Winmalee
GC (Glen)	Prout	VK2KIS	Marsfield
K (Kruno)	Ratkovic	Assoc	East Nowra
G (Ganeshwaran)	Rajoyogam	VK2MMH	Homebush
GG (Geeta)	Rajoyogam	VK2GVI	Homebush
S (Steve)	Reeves	VK2CT	Mr Pleasant
D (Donald)	Smith	VK2BDU	Deniliquin
C (Con)	Socuoc	VK2AAU	Sylvania
NS (Norman)	Steele	VK2NSS	Granville
VN (Victor)	Stafford	VK2XOI	Copacabana
G (George)	Tanios	Assoc	North Rocks
R (Raymond)	Tooby	Assoc	Hornsby
TF (Thomas)	Vandermeel	Assoc	Oakhurst
FA (Francis)	Wright	VK2FUU	Ryde

Eight amateur clubs/groups participated:

1. Gladesville Amateur Radio Club Inc, Amateur Television, VK2TVG, several operators, 16 reports.
2. Liverpool and District Amateur Radio Club, VK2AZD, VK2SE, 21 contacts.
3. WIA NSW Division "Picnic in the Park" 60 years of the ARC, VK2GNT, VK2CAM, VK2AXT, 10 contacts.
4. WIA — NSW Division, broadcast and callbacks, VK2WI, VK2AGH Lismore, VK2ETK Orange, 197 contacts.
5. Clan Macleod/James Craig, iron barque undergoing restoration in Sydney Maritime Museum, Darling Harbour. VK2CAM, VK2GNT, VK2AXT, 72 contacts.
6. Hornsby and District ARC, VK2DEJ, VK2EYC, VK2DJW, VK2FKP, VK2MJ, VK2CNI, VK2JGV, VK2PEJ, VK2MA. Total contacts 531.
7. Royal Naval Amateur Radio Society, VK2 Chapter, VK2TJ, VK2CWS, VK2FYM, VK2CNI, VK2CC, 165 contacts.
8. Australian National Amateur Radio Teleprinter Society, VK2BQS, VK2JPA, VK2TTY. Approximately 22 contacts.

Ten individual amateurs have taken part in the V1150SYD activity. Callsigns and number of contacts, not in any particular order: VK2DT (35), VK2TZ (429), VK2BEX (595), VK2RV (500), VK2CSZ (78), VK2LEE (290), VK2KA (207), VK2SKY (525), VK2ZSC (14) and VK2PS (2669).

The number of DXCC countries worked is over 160. Total number of contacts: 6257.

Transmission modes used: SSB, CW, RTTY, Packet, FM, ATV. Twelve amateur bands used, from 1.8 MHz to 450 MHz.

5/8 Wave

Rowland Bruce VK5OU

A month gone by and I'm back into things again, and it was great to hear of all that had been going on whilst I was away. In particular, the co-opting of three new Council members and their accepting various positions, has relieved the pressure on others considerably.

The men in question are:- Maurie Hooper, VK5SEA, as Secretary, Membership Secretary and Journal Editor, Garry Herden, VK5ZK, as Minutes Secretary, FTAC Representative and SAPUG Representative, and Don Wilton, VK5KDW, Examination Officer. Thanks guys!

Even when I'm back in town well laid plans can go awry. It appears that I missed an excellent talk by Garry at the February General Meeting. One of these days I SHALL get to a talk that will stir me into Packet. One of these days!

Considerable work seems to have been done on preparing proposed changes to the Constitution. Details were published in the February edition of the Journal. If you missed them I'm sure Maurie would be able to drag up a copy for you (SSAE?), and don't forget to come along to the AGM this month to vote on them and to elect your new Council.

Of course, you cannot win them all. No sooner does one position get filled than another occurs. This time it is the QSL Bureau. Alan, VK5ZN, is moving to sunnier climes. (Today was PERFECT in Adelaide All!) We shall all miss him, and Miwa at the BBG dispensing the cards, and chastising those who made life

difficult for him. Perhaps you'll get the Q job? Thank you both for an excellently done job. And thank you Alan for arranging a successor. John Vaiciulis, VK5FOX, has taken over. John is an avid DX'er, and I recall from my own days as bureau manager that he was an almost perfect QSL'er. (The card size just a little big, eh? Let's see what you do with them, John.) The address remains the same — Box 10092, Gouger Street, Adelaide 5000, not the familiar GPO Box 1234, Adelaide 5000 that the normal WIA mail goes to. As far as I know the system is unchanged too, at least for the moment.

It's always good to hear of new members, and there has been quite a swag of them lately.

Welcome to the WIA SA Division to

Wally Butler VK5MAB
David Giles VK5JAA
Trevor Harding VK5ZLM
Jeff Hollitt VK5JK
Rod Kopp VK5SX
Lew Schaumloefel VK5AKO
Danny Stefanac VK5NSD
John Sutherland
Michi Uchida VK5KCW
B Warner VK5KBW
Grant Willis VK5ZWI
A Rechner VK5EK

Also, from the Territory, we welcome Gordon Hemming VK6ZZ, and Mark Phillips VK8MA.

It was good to hear at the recent Council meeting that the number of members had not decreased in January as much as in previous years. Let's hope the positive trend continues once the mad New Year rush for renewals has passed its peak.

On the WICEN front there is a flurry of activity ahead. Volunteer operators are appearing for the Walk Against Want, (probably over by the time you read this,) and the SA Great Bike Ride in May.

The National Parks and Wild Life exercise has been deferred to next year, but the NPWS is still looking for operators. Ian Watson, VK5KIA, is the Co-ordinator to talk to if you are interested in WICEN.

Notes from VK6

December 1992 General Meeting and Presentation Night

The Divisional Council decided that it was again time to recognize the untiring efforts of

some members in providing the Weekly News Broadcast, and all its relays every Sunday, and the Morse Practice sessions almost every night, on either HF or VHF.

Eleven of the thirty one recipients were able to be present to have their plaques presented by the President Cliff VK6LZ.

Mal, VK6LC who was the previous Morse co-ordinator, and had designed and constructed the units used by the Morse team, accepted an award on behalf of the absentees.

If you can give a couple of hours, twice a week or month, you can become part of the Morse team. Phil VK6SO would very much like to hear from you.

State News Broadcast Team

Harry Atkinson	VK6WZ
Nick Morgan	VK6ND
Glen Thurston	VK6ZGT
Cyril Eakins	VK6CN
Bruce Williams	VK6CX
Don Reimann	VK6DV
Ted Davies	VK6ED
Chris Carter	VK6FC
Don Graham	VK6HK
John Tower	VK6IM
Dave Couch	VK6WT
Aubrey Keightley	VK6XY
Reg Evans	VK6YE
Nth Corridor Radio Group	VK6ANC

Tom Deans	VK6BDT
Bob Blinco	VK6KRC
Phil Jamieson	VK6ZPP

State Morse Practice Team 1992

Phil Bussanich	VK6SO Co-ordinator
Barry Butler	VK6AF
Mark Bussanich	VK6AR
Dianne Cousins	VK6BC
Ken Hammond	VK6KN
Rob Walter	VK6RG
Martin Suter	VK6SA
Joe Anderson	VK6ALJ
Neil Basden	VK6ANB
Bill Jones	VK6BIL
Rod Harrod	VK6BRH
Max Schimpf	VK6MAX
Charlie Bird	VK6NCB
John Bearsby	VK6YBP

State News Relay and State Morse Practice Team

Emmanuel Zimmerman VK6NEB



The recipients of their awards are—
Standing Left to Right: VK6ZGT, VK6HK, VK6LC (now also VK6LC), VK6AF, VK6SO, VK6RG, VK6YBP.
Kneeling: VK6AR (ex VK6AMB), VK6NEB, VK6ANB, VK6CX.

VHF/UHF An Expanding World

Eric Jamieson VK5LP *

All times are UTC

Six metres

Despite a general falling off in Es activity, let no one say that six metres is dead, far from it, as shown by this generalised report from Steve VK3OT, who is not available to operate on the band every day! Scattered amongst the JAs are a few very good contacts to other areas, so it will pay to be vigilant, especially during April.

31/12/92: ZL4TBN, VK3MC. 1/1/93: 0004 to 0035 VK2XIC, ZL2UJH, VK3DQAZ, ZL3MFH/b, VK4ABP, ZL2QZS, ZL2TPY, ZL1ANJ; 0300 to 0635 VK2ZHE, VK2EFA, JA7ZMA/b, JH7BKN, 2/1: 0200 to 0230 VK2JSR, VK4ABP, VK4ANP, 4/1: 2205 ZL1ANJ, 2230 VKAZAZ. 7/1: 0800 VK8AH, ZL3MFH/b, 8/1: 0100 to 0120 VK6RPH/b, VK6KZ, VK6ZPP; 0313 to 0745 VK6RPH/b, VK6ZPP, JH1WHS, JH4MGU, JA7ZMA/b, VK4BRG/b, JH0HZO, JE2DWZ, BZ4SB, P29JA. 10/1: 0513 to 0741 KH6IAA, AH6LR, VK4BRG/b, VK1RX. 17/1: 0143 to 0305 AH6LR, KH6HI, KH6HME, AH6JF, JA7WSZ, VK4BRG/b, JA7ZMA/b, JH0HZO. 20/1: 0730 to 0749 JA2BZY, JR1ZY, JA7ZMA/b, JA2GY/b, JH1WHS, JE1BMJ. 25/1: VK4BRG/b, JE2DWZ, 06/1: 0325 to 0945 VK4BRG/b, JA6QGG, JA7ZMA/b, JA2GY/b, JH1WHS, JACM0, JA7WSZ, JA4QHO, VK4ABW, VK8VFB, VK8RH, VK4ABP, 27/1: 0100 to 0130 VK4BRG/b, JA7ZMA/b, VK4ABP/b.

7/2: 0418 to 0435 JABTSG, VK4ABP/b, VK4BRG/b, JA6GSZ, JHBZND. 18/2: 0200 to 1345 JH1WHS, JA7ZMA/b, JA2GY/b, VK4ABP/b, JH4JPO, JE2DWZ, JJ1CKD, JH3APG, JA2DDN, JA6YBR/b, JE6OKI, VK4EJR, JA4GYM, JI2UNR, JF2JFD, JACM0, JI1WKX, JR2HCB, JI1NRL, JI2EVL, JJ6LPG, JA7QO, JA9IPF, JA1CWN, JA5FDJ, HL9UH, KC6RR, P29PL, BV2DP, JA3JS and 6 to 1345.

On 23/2 Andrew VK6AH scored a good catch when around 1300 he worked XUSDX and XUOUN from Cambodia and these are believed to be the first six metre contacts between VK and XU. Here is further proof that no one can safely declare that six metres and/or Cycle 22 is finished. It seems that whenever there is a good opening to JA, then one should be delving around for that rare contact, although sometimes good contacts can be made on what appears to be a dead band.

John VK4TL from Malanda, North Queensland, in a letter upgrading his Six Metres Standing's List, said the first TEP for the year appeared on 17/2 with three JA QSOs on 0941 and 1049. Also propagation to VK3 and VK5. On 18/2 open early to VK3 and VK5, then 44 JAs on a beam heading of 315° for maximum signals which is 45° from normal direction. On the same beam heading John also worked KC6RR, HSLUH and BV2DP.

John queries whether anyone has worked VR6JJ on Pitcairn Island as he heard a southern station in contact with a foreign sounding station on 50.120 with a beam heading of 105° around midday local. No date supplied.

David VK2BA also updates his list and says that in the March to June period of 1992 he heard or was heard by JT1, UZO, HKO, C6 and ZK3 and missed them all. He says the Sydney area is disadvantaged by much white noise from the new ABC Ch 2 transmitter, which radiates a strong spurious on 50.700 MHz with birdies up and down the band, some close to 50.090, 50.105 and 50.120. David concludes by saying I guess that things are not as bad as they were with Channel O on the air!

It is of interest to note that although VK5 does not have a Channel O transmitter, on many occasions throughout the year and much more so during the summer Es period, the Channel O station in Toowoomba is so strong in this State (and probably Victoria) that massive amounts of krud blanket large sections of 50 MHz, wiping out weak signals and forming a nasty background to the stronger stations, those mostly from VK2 and VK4. Fortunately, to a large extent, the problem is alleviated when the antenna is turned away from VK4, especially when looking towards VK6.

It was good to receive a letter from Col VK7LZ who first came on the air in 1933. He had a long time interest in six metres and said that from 24/11 to 24/12/92 he worked VK2, VK3 and VK4, plus JA2, JA7, JA8, ZL3TY, ZL3AAU, ZL4TBN/3. On 19/12 he was pleased to work NI6E/KH6 and on 24/12 a contact with VK8RH in Darwin, a rather rare contact in Launceston! Col said there were many more VKs to work but he was looking for stations from other countries.

Early days on six metres

Lance VK4AZZ recently wrote an interesting letter which included reference to the 1950s so here is some of it. Lance writes "I was in Mount Morgan when I first came on the air, initially on

five metres, then moving to six when we got clearance for work with the IGY. This activity probably got limited licensees on to six metres. The authorities at the time probably did not know that we were about to demonstrate that six was an International Band. I actually had a five metre DX contact via Es to Jack, VK2ADT at Inverell."

As an example of the work needed in earlier days, I hold WAS Certificate No. 26 issued on 19/1/62 and endorsed for JA, W, ZL, VK9 Papua, VK9 Territory of New Guinea and KRS. I entered the six metre arena in October 1957 and this result was consistent with that of others of the era, with all contacts on AM. By comparison, during the recent Cycle 22, on several occasions I worked up to seven new countries in a single day — more than I had been able to do in those first five years of my operating."

Lance also included a couple of pages of early contacts, accompanied by appropriate comments. I have selected a number for readers interest.

25/10/57 1039 JA3GI — six metre permit just arrived. JAs copied previously but this my first JA contact. 30/10/57 1030 VK2WH — Hugo was my first six metre interstate contact. 16/2/58 2230 43.8 MHz Twin Cities paging service (US), first of many such paging services received, including some South American services. Same day worked JA2OW who queried the legality of my call sign. He thought it was too far down the alphabet so soon for a VK4 — very tortuous to convey what a Z call was to a Japanese! 2/3/58 0958 JA9DC — achieved AJD with this contact. In later years AJD was achieved in one day on many occasions. Also worked mobile in 1989. 10/3/58 0944 KH6NS — Ed is still around on six metres.

16/3/58 0137 WOCNM, W7SPO, K6ERG, W6WWO, KGPXT and others worked through heavy JA QRQ. Some Ws using converted SCR522s. KGPXT still a regular on six metres. 19/4/58 am — good backscatter to north east. Stations included VK9NT (TNG), VK9XK (now VK4XA) Morebly, VK4XJ Bundeberg, VK4HD Budimir and ZL1DE. Stations all had crystal frequencies, which by gentlemen's agreement, were sufficiently apart. 20/4/58 2210 CE8AE the IGY beacon received at good strength. Apparently no other activity from that location. The path was interesting in that it does not cross the geo-magnetic equator — F2.

23/6/58 0830 — inband video signals. This may have been the first time I received BBC TV, confirmed later. 30/10/58 0845 JA2AQ — first mobile QSO to JA, 5x9. I used 4 watts to a 2E26 and whip antenna. 8/2/59 0920 BBC1 and 2 approximately 48.250 and 50.250. Test pattern and music. BBC was AM sound at that time. Reception confirmed by Engineering Branch who strongly advised Australia to stay out of Band 1 for TV. This letter was sent to Planning Section, Radio Branch, with lack of success.

5/4/59 1205 KR6AK — Okinawa was a separate country then. VS6CJ was also heard under S9+ JAs. First logging of US scatter link across the Pacific and range of frequencies around 49 MHz and upwards to about 49.6 or so. 20/11/59 0930 BBC TV again. Note time and dates — six metre contacts into Europe are made around this time. Pity no one there had permits. An El got a spot frequency, but as far as I know, only worked US and down to the Mediterranean and perhaps South Africa.

WIA News

Cheats Don't Prosper

A Queensland amateur has had his certificate of proficiency and station licence cancelled by the Department of Transport and Communications (DOTC).

The action follows investigations into irregularities in the conduct of examinations in one district in Queensland.

The WIA Exam Service has suspended a number of accredited examiners recently. DOTC investigations are still continuing. We will advise the outcome when more information comes to hand.

It is understood from general discussions with DOTC that incidences of cheating under the WIA-administered examination system are very much less than that under the previous system.

22/4/60 1205 KATAX Americans working out of Japan; KA2FW was another regular. 15/9/60 — JA station number 1000 worked. 22/3/69 1320 KG6/K7HIX Guam. US Navy airmen. Ken set up lunch time skeds which worked from a dead band at times. 4/6/69 1307 HL9WI Bill on AM/SSB.

I am sure that Lance could write a fascinating story in relation to early six metres. Incidentally, as much of his work entailed travelling in a car, he made many contacts to out of the way places using his six metre mobile equipment. He notes that his six metre mobile record is not much short of the VK4 short path record. It was to FM5WD who was 5x9 and gave a return report of 5x8, with Lance using about 40 watts and a 1/4 wave whip.

From Europe

Ted Collins G4UPS reports that the Republic of Czechoslovakia no longer exists and from 1 January 1993 it was replaced by the Czech Republic and the Republic of Slovakia.

The Czech Republic has continued to use the OK1 and OK2 prefixes plus OL prefixes, and Slovakia has replaced the OK3 prefix with OM3, while it waits for a completely new callsign allocation from the ITU.

Ted also reports a general release of the six metre band to Class A amateurs in Poland from 15 January 1993, with a ten watt power limit and no antenna restrictions. However, to gain the six metre extension to their licence the amateurs are required to pay the equivalent of one month's salary! (That kind of requirement would make VK6 snort...!).

The January band report from Ted indicates a considerable reduction in general contacts except for 16/1 when from 0858 to 2130 he was kept busy with DJ6, DL7, EH3, EH5, EH6, EH7, ES5, F2, G3, I2, I3, I4, IK2, IS0, LA9, OE2, OK1, OM3, OZ1, OZ3, OZ4, OZ6b, OZ7b, S51, S57, S59, SM0, SM2, SM7, YU2. That's fourteen countries in 11½ hours of Es!

Geoff G4ICD from Jersey Island has confirmed the position regarding Czechoslovakia and Poland. Also, despite information to the contrary, Swiss stations have gained an extension for the use of 50 MHz but not on a 24 hour basis as reported — all operating is outside TV hours. The Vatican City now joins the ranks of 50 MHz countries with HV4NAC. This is a new country for both RSGB and ARRL. Geoff also reports that within Europe there are more than 20 countries still active on Band 1 TV ie 48.250 to 49.750 MHz.

Countries first worked on six metres from Australia

Add new entry: XU5DX Cambodia 23/02/93 VK8BAH: HL9WI change from VK8GB to VK4AZAZ 04/09/69; change KG6DX to KG6/K7HIX worked by VK4AZAZ 22/03/69; change KH0/JJ1AEK to KH0AC worked by VK4AZAZ 07/04/88; V31PC change from VK4ZJB to VK4AZAZ 19/04/88; change VK9BW to VK9NT worked by VK4AZAZ 01/06/58; ZK1WZ change from VK4ZJB to VK4AZAZ 28/03/89.

I have already commenced the state by state break-down of prefixes worked in Cycle 22 and this will be ready for your perusal in due course. Since 1 January 1984 has anyone worked the following: ZS4 Kenya, 9N1 Nepal, CR9 Macao (XX9 since 1985), VK9 Christmas Island, VP2

British Virgin Islands, VU2 India, ZD7 St Helena Island and ZD8 Ascension Island? If so, could you please advise me your callsign, the callsign worked, country, date and time. All were worked prior to 1 January 1984, but I am not sure if any have been worked since that date.

VHF/UHF Field Day

Doug VK4OE phoned to say he operated from Siding Springs during the Field Day on 16-17/1, from where he had contacts to Sydney and Canberra on 144 and 432 MHz. Chris VK1DO was on Mt Ginninderry and Eddie VK1VP in Canberra. Also worked was VK2DVZ at Taree. On 23 cm he worked VK4KZR4 who was on Mount Mowbray, an all land distance of 570 km.

The Geelong Amateur Radio Club newsletter said their team set up a field day station on Blue Mountain, arriving on 15/1 in hot weather, followed by rain at night, then a fine morning on 16/1. The 24 hour competition commenced at the same time as the rain bucketed down for five hours, requiring a good sized camp fire to dry rain-soaked articles.

The GARC team worked consistently during the 24 hours and accumulated in excess of ten thousand points, aided by a JA opening on six metres. They also scored good points for 70 cm contacts to VK1 and VK5. The club is planning a further trip, this time for the John Moyle Field Day on the weekend of 20/21 March.

Two metres and above

On the basis of reports received there has been the usual activity on the bands up to 1296 MHz but nothing of outstanding importance.

However, a letter arrived last year from Chris G3WOS in response to my query regarding what was being done in the UK and Europe to promote long distance contacts on the bands 144 MHz and above. At the time I could not use the information due to pressure of space, but you may be interested in the following as it applies to the above areas.

Chris says "I suppose the ultimate challenge to a 2m buff is to complete a transatlantic QSO. The distance from most any part of western Ireland to eastern Newfoundland is a little over 3000 km so the QRB is not the problem. Distances of that magnitude, and more, have been achieved on tropo occasionally and by sporadic E more frequently. For example, 24 of the top 100 stations in the German 'Dabas Magazine's Top List' on 144 MHz claim ODX 3000 km, eg HG0HO 3865, DL7UME 3624 and DL7AKA 3620 km, via Es. From GW, GD and GI there is a good 3000 km sea-dart tropo path to EA8 at certain times of the year — and on 70 cm too.

Many seem to think the Atlantic will be spanned by double-hop Es, but I reckon that's a tall order. First of all, Es at these latitudes is less frequent than it is in the Mediterranean region, where double-hop Es from Portugal to Israel occurs in summer — getting on for 4000 km. Second, the likelihood of two Es reflecting regions in the right places seems pretty remote to me. No, I figure the most likely mode will be by tropo. Most every year there are one or two days when a long sea duct exists across The Pond, as we call it. So far though, when the signals have got to within 100-200 km of land they have encountered a rotten weather front

which has effectively blocked any further progress.

What we need is for Es and VE's to keep a constant watch on the North Atlantic weather situation and set up keyers every time conditions look promising. The problem is there aren't any motivated Es on VHF in the remote western regions of Ireland, and precious few in Newfoundland either.

From the Mediterranean, TEP type contacts have been made to ZS3 from Italy and Greece on both 144 and 430 MHz. Those are very long distances and the mechanism has been known for decades. The signals have a characteristic watery sound. In the UK we are too far north of the geomagnetic equator to get in on this act, though it might just be possible for GJ4ICD to do it, one day, given the right conditions and a following wind!"

Closure

There is little else to report. The weather patterns across southern Australia have been unreliable and seemingly incapable of any sustained activity on 144 MHz and above.

Closing with two thoughts for the month:

1. Finance is the art of passing currency from hand to hand until it finally disappears, and
2. An adult may see human wisdom manifested in its highest form by watching a child's boundless capacity for ignoring celebrities.

73 from The Voice by the Lake.

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ar

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Repeater Link

Will McGhie VK6UU *

Will Scott VK4XP follows his simple link controller with a simple ident unit.

Simple Ident Unit for Repeaters

This ident unit suits any repeater or beacon as an automatic Morse identifier. It can also be connected directly to the simple repeater link controller described in a previous article.

This unit is designed to send out the ident every ten minutes. Also to stop the ident being sent over another station's conversation, it is only sent on loss of carrier, not on commencement of carrier, as found on most ident units.

The unit is made from low power CMOS chips and can readily be set up on a solar powered repeater as the current drain is very low.

The Circuit

Shown is the circuit for the ident unit. It is made on veroboard and requires no special construction techniques or methods. The usual CMOS precautions are of course necessary when handling the chips out of the veroboard.

IC1a is part of a 556 timer chip, which contains two 555 timers. It is the clock and sets up the speed of the ident. With the components shown, it runs at about 18 Hz. To vary the speed, adjust C1, a 4.7 μ F capacitor. The larger the capacitor, the slower the ident speed.

IC1a clocks a 4040 binary counter IC2. The counter counts upwards on each clock pulse. It is reset to zero when not sending the ident by a high on pin 11.

IC3 is connected to the 4040's output lines. It is a commonly available 2764 EPROM. The

2764 has a very large capacity which is largely unused in this project. It is used in the circuit because it is readily available and is more economical than other EPROMS with a lower capacity.

The 4040 drives the address lines of the EPROM, while only three of the data lines are used. The three lines are D0, D1 and D2. D0 is the actual Morse ON/OFF signal, D1 is used to key the transmitter Press to Talk (PTT) and D2 is used to reset the ident unit back to the beginning after the ident has finished.

D0 is connected to IC1b, the other half of the 556 timer. This timer is configured as an audio oscillator which is turned ON and OFF by the EPROM. The square wave output from the 556 is smoothed by an RC network R6, C3 and C4 before being set to the correct level with R7 and being passed to the transmitter microphone.

D1 is used to hold the PTT line down while the ident is being sent out. It is fed to TR1, which acts as a buffer for the transmitter relay when wired direct to a radio transmitter.

D2 is the reset line. It is fed to another 555 timer, IC4. This IC sets the time between ident and is adjusted by C5, typically 100 μ F.

IC5a is a 4013, a dual D type flip flop. It is the chip which is used to memorize that the ident is ready to go 10 minutes after the last ident was sent. Once set by IC4, it waits until a carrier appears then disappears before giving the OK for the 4040 to start counting. This allows a station to put in a call on a repeater without being accompanied by the Morse ident.

The power supply is 12VDC which in turn is regulated down to 5VDC to run the ident unit by the 7805 chip.

Programming

The EPROM must be programmed with the individual sounds and spaces between the sounds of the ident signal. For example, the letter "V" consists of a unit of sound (a dit), a unit of no sound, a second unit of sound (a dit), a second unit of no sound, another unit of sound (a dit), another unit of no sound and finally three units of sound (dah).

Only data bits D0, D1 and D2 are programmed, the rest are unused.

The table shows a typical program listing for a repeater. Note that there are firstly a couple of no sounds to commence with. These allow a slight pause before the ident commences. Then the ident itself runs out with another pause at the end of the ident. Finally a reset occurs by line D2 going low.

The program can easily be entered by hand using any EPROM programmer. As well, very long messages can be programmed into the ident unit if required.

Connecting to the Link Controller

The ident unit was designed to connect to the simple link controller, described in January 93 AR. For this to occur, R7 is not required as the audio level is set up on the controller board with another potentiometer.

The COR (Carrier Operated Relay) sense line and the PTT (Push To Talk) line are connected together as a single line that can be used for both PTT and COR sensing.

Because the unit runs off 5VDC a zener Z1 and resistor R9 is used as a level converter for the difference in input voltage levels. They may be replaced by a tie up resistor to 5VDC when being used with a 5VDC controller or CO relay.

Beacon Ident

The unit may be used as a beacon by removing IC5, the 4013 and linking pin 4 to pin 2. The ident will then cycle regularly. The time between ident will still be controlled by C5, the 100 μ F on pin 6 of IC4.

This unit was originally constructed for VK4RMV, the Miriam Vale linked repeater on 7625. It has proven very reliable with not a problem since it was built and installed several years ago.

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DESIGN VK4XP
DRAWN VK6UU

Awards

John Kelleher VK3DP Federal Awards Manager

Worked all States (WAS)

The WAS (Worked all States) award is available to all amateurs worldwide who submit proof with written confirmation of having contacted each of the 50 states of the United States of America. The WAS awards program includes 10 different and separately numbered awards as listed below.

Two-way communications must be established on amateur bands with each state. Specialty awards and endorsements must be two-way on that band and/or mode. There is no minimum signal report required. Any or all amateur bands may be used for general WAS. The District of Columbia may be counted for Maryland.

Contacts must all be made from the same location, or from locations no two of which are more than 50 miles apart, which is affirmed by signature of the applicant on the application. Club-station applicants, please include clearly the club name and callsign of the club station (or trustee).

Contacts may be made over any period of years. Contacts must be confirmed in writing, preferably in the form of QSL cards. Written confirmations must be submitted (no photocopies). Confirmations must show your call and indicate that two-way communication was established. Applicants for specialty awards or endorsements must submit confirmations that clearly confirm two-way contact on the specialty mode/band. Contacts made with Alaska must be dated 3 January 1959 or later, and with Hawaii dated 21 August 1959 or after.

Specialty awards (numbered separately) are available for OSCAR satellites, SSTV, RTTY, 432MHz, 144MHz, 50MHz and 160 metres. Endorsement stickers for the basic mixed mode/band award and any of the specialty awards are available for SSB, CW, EME, Novice, QRP, packet and any single band. The Novice endorsement is available for the applicant who has worked all states as a Novice licensee. QRP is defined as 10-watts input (or five-watts output) as used by the applicant only, and is affirmed by signature of the applicant on the application.

Contacts made through "repeater" devices or any other power relay method cannot be used for WAS confirmation. A separate WAS is available for OSCAR contacts. All stations contacted must be "land stations". Contact with ships (anchored or otherwise) and aircraft cannot be counted.

HQ reserves the right to "spot call" for inspection of cards (at ARRL expense) of applications verified by an HF Awards Manager. The purpose of this is not to question the integrity of any individual, but rather to ensure the overall integrity of the program. Failure of the applicant to respond to such a spot check will result in non-issuance of the WAS certificate.

Disqualification: False statements on the WAS application, or submission of forged or altered cards, may result in disqualification. ARRL does not attempt to determine who has

altered a submitted card; therefore do not submit any marked-over cards. The decision of the ARRL Awards Committee in such cases is final.

Application Procedure (please follow carefully): Confirmations (QSLs) and application form (MCS-217) may be submitted to an approved ARRL Special Service Club HF Awards Manager. ARRL Special Service Clubs appoint HF Awards Managers whose names/addresses are on file at HQ.

Be sure when cards are presented for verification (either locally or to HQ) they are sorted alphabetically by state, as listed on the back of application form MCS-217.

Five-Band WAS (5BWAS)

This award is designed to foster more uniform activity throughout the bands, encourage the development of better antennas and generally offer a challenge to both newcomers and veterans. The basic WAS rules apply, including cards being checked in the field by Awards Managers; in addition 5BWAS carries a start date of 1 January 1970. Unlike WAS, 5BWAS is a one-time-only award; no band/mode endorsements are available. Contacts made on 10/16/24MHz are not valid for 5BWAS. In addition to the 5BWAS certificate, a 5BWAS plaque is available at an additional charge.

DXCC Profiles — Ken Jewell VK3AKK

"I was first licensed in 1962 as VK3ZNJ after I completed my technicians training at the RMIT, and spent the next 14 years on VHF. I suppose I was bitten by the DX bug by my limited

exposure on six metres initially, then on field days with VK3APC. Others who let me take over their shacks and work DX were the late Reg Waters VK3AWV, and Geoff Wilson VK3AMK. I operated from Beaumaris until I got married and moved to the Geelong area where I still live.

The prostration ceased in 1976 when I became VK3AKK, which was formerly held by Ken Nisbet who moved to NSW, and was pleased to release the call to me. Since then I have had around 40,000 QSOs and have qualified for all of the following major awards: 5 BAND DXCC, 5 BAND WAS, WAZ on 20, 15, 10, WAJA, DLD 200, USA County award 1000 on 10 metres, all DXCC countries (305 worked on 10m).

To achieve the results I have not been that easy, but it has not taken a really spectacular station. I have always used a three-element triband beam at 45 feet or inverted vees for the lowbands. The transceiver is an Icom 745 which drives a Yaesu FT2100B, and the linear has not changed since I started. So you see the station is quite average and can be seen in similar fashion in shacks all over the country.

Some advice for those looking to complete all countries or just starting, is first of all listen to what other DXers are talking about and make notes. Also develop a network of contacts, as you cannot watch the bands all the time; make a wanted list which you keep handy and send copies out to your friends as they may hear the one you need and call you. Learn the characteristics of the bands as to when the propagation is best to the various parts of the globe. I have worked hardly any of the countries for DXCC after midnight or before 7am, so you do not have to lose sleep and upset your wife.

I have just passed my 50th birthday, am married to a nurse and have one son doing VCE. I am employed by Telecom, where I have been for 30 years, and my current job assignment is as a Systems Consultant."

WIA News

New RTTY/AMTOR Book

Amateurs keen on experimenting with RTTY and AMTOR communication modes, would be interested in a new book from the ARRL called "Your RTTY/AMTOR Companion".

It is the latest addition to the ARRL's "Companion" series and is written for amateurs exploring these modes for the first time.

For those new to amateur radio, RTTY — "radioteletype", you may remember — is a form of long-distance digital communication used on the HF bands. AMTOR is a variation of RTTY involving an error-detection system, which has become quite popular.

The author, Steve Ford, WB8IMY, describes in detail how both modes operate

and shows how to set up a basic RTTY/AMTOR station so you can enjoy "keyboard" conversations with other amateurs.

AMTOR "APLink" bulletin boards are also covered. These provide links between the long-haul AMTOR network around the world and local VHF/UHF packet radio networks and bulletin boards. Amateurs send "mail" messages and circulate bulletins around the world via this network.

The new book also includes coverage on the new digital modes of Pactor and CLOVER beginning to spread on HF.

Enquire from your Division. We hope to have a review for readers in a forthcoming issue of AR.

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habits will be impossibly hard to break if you keep going back to them. For the first few days try to relax and just send code until you get used to the feel of the new paddles. This is best done off air, perhaps reading from a book, until you make fewer mistakes. When you have time to think you can start by thinking about one letter at a time and after a little exclusive practice on that letter you can start sending it iambically in context. You may feel like trying more at one time but I recommend sticking with the one letter until you can send it iambically without thinking, then go on to the next. I started with k and r then added c and full-stop and left f and l to the last as they seemed to me to be the most difficult. Don't be discouraged if you occasionally slip back to the old habits on one or two letters, especially if you are excited at the time. This usually means you are like me and not getting enough practice, nothing more.

If you are already using iambic techniques there is another choice to make when selecting a keyer. You may have heard about the type "A" and type "B" devices from Curtis Electro Devices. It is very hard to describe the difference but the type "B" device is explained as adding an element of the opposite type when you release the paddles. If you are a type "B" operator and you run across a type "A" device try sending "CQ". If the device is type "A" you will probably get "KG" or possibly "KG". If you are a type "A" operator you will probably get an extra dash at the end. Most built-in keyers and memory keyers on the market are type "B" so if you must choose, I suggest starting with the most common. The

8044 ABM chip has both and the "A" type seems much harder to use to me. The effect is similar to that which I get when I switch off the dot-dash memory on my ETM-8C keyer. The other feature which many people will have seen is the auto-word-space as found on the accu-keyer kits. (EA March 1978 I think) Auto-word-spacing is a very handy feature in that it makes the sending less critical for perfect Morse. I wonder why it is not incorporated on the Curtis chips? What happens is that the keyer remembers when the last character or element was sent, and if the next element is sent too late (longer than three dot lengths is the letter spacing if I remember correctly) the keyer waits a further few dot lengths before starting to send the next element. That is, provided you wait a little longer than a letter space you will automatically get a full word space. This feature is excellent for speeds up to about 30 WPM after which, depending on your expertise and your paddle, mistakes such as "ET" when you want "A" or "EG" when you want a "P". At this time you will be going pretty fast anyway and should be able to handle the word spacing without help so you can switch the auto-word-spacing off.

If you are like me you will have two or three keyers and assorted paddles, maybe all on the bench at the same time, with the hand pump tucked away in the corner somewhere. Iambic keyers are for the lazy. If you want to send reasonably good Morse for the least energy output, then they are for you. I have nothing against the hand key or the purists who don't want to give them up. It is a welcome change to reach for the old brass key and have a go

from time to time, but for efficiency the only way to beat the keyer and paddle combo is to use a computer or keyboard. And that is not hand sending, so it seems to lose a bit of the fun. I am a little surprised that they are not as yet allowed when taking the licence exams.

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reading the authoritative source — Amateur Radio Action
magazine... at your local news outlet every fourth Tuesday.*

QSLs from the WIA Collection

Ken Matchett VK3TL Hon Curator WIA QSL Collection *

Navy — Senior Service Part 2

The year 1986 saw the 75th anniversary of the Australian Navy. During this year a special effort was made by operators of the VK3RAN station to activate the station frequently so that the greatest opportunity was given for other amateurs to qualify for what is known as the "Castlemaine Award", details of which appeared in the July 1986 issue of AR. The ship itself is a Bathurst class corvette/minesweeper which was built at Williamstown and was commissioned in 1942. She served with distinction in northern waters during World War 2, mainly as an escort ship. After the war she became a training ship and eventually was restored as a museum ship in June 1974. Readers are referred to the article entitled "HMAS Castlemaine", which appeared in the September 1986 issue of AR.

VK2CC

The station VK2CC is the club station of the NSW chapter of the RNARS. It is the "Sydney" Training Depot located on Snapper Island, a rocky island off the coast of Drummoyne, NSW. The interesting story of the establishment of this training centre is to be found in the article "Snapper Island: Part of Sydney's Maritime History" by CW Schreuder VK2CWS, which was published in the January 1992 issue of AR. The HMAS Sydney, which ship engaged the German cruiser "Emden" in September 1914, and which played a most notable role in Australia's maritime history, was sadly sold to Japan for scrap during the Great Depression, but not before several items were removed from the doomed ship and which are now housed in the "Sydney" Training Depot, named in honour of that great ship. It is to the credit of the operators of this station that a considerable number of their QSL cards have been despatched to stations throughout the country.

Yet another RNARS Australian station is VK2BNR. This is the club station of "HMAS Nirimba" (RNARS member number 1385) and which can only be operated by a serving RAN amateur based on board. The name "Nirimba" is said to be an Aboriginal name for pelican. The QSL collection holds a few of such QSLs

as well as those of VK6RAN and VK5RAN (the club stations of the West Australian and South Australian RNARS).



VK2BST

Mention should also be made of the operation of Surgeon Rear Admiral Jim Lloyd RAN. This distinguished radio amateur has been quite active from his early days in the Navy with the call VK3CDR, although he did hold other calls including G3DKI and VK3AST. One of his VK3AST QSLs dated August 1963 (when he then held the rank of Surgeon Commander) reads: "VK representative, Royal Navy ARS." His early 1954/55 VK3AST QSLs indicate his rank as a Surgeon Lieutenant. During 1967 Jim transmitted from VK2BST, the station callsign of the Naval Air Station at Nowra, NSW, whose very imaginative QSL card is reproduced here. His present callsign is VK1JL. An active executive officer in the WIA, Jim was featured in the February 1977 edition of AR.

VK4RAN

The WIA Collection also contains QSLs of the station VK4RAN. This is also a maritime museum ship, the former HMAS "Diamantina", named after the famous river system in Queensland. The ship is a River Class frigate designed in Great Britain and was used mainly during WW2 as an anti-submarine vessel. She served in New Guinea and Solomon Islands waters. The surrender of Japanese forces on Nauru, Ocean Island and Bougainville Island

was signed on board this vessel. Restored as closely as possible to her original condition, she now rests in dry dock at South Brisbane. The radio station VK4RAN on board the maritime museum (operated by the Queensland Maritime Museum Association) is also a member of the RNARS.

As well as its large collection of amateur radio QSL cards, the WIA collection also holds several post-war and pre-war QSLs of commercial radio stations, ship stations and shore stations. Amongst these may be found station VJLQ1 operated by KW Harris aboard HMAS "Albatross" VZDB Naval Staff Officer at Port Melbourne, and giving details of its spark transmitters, VJMP on HMAS "Success" (dated October 1929) and VHE, the Royal Australian Naval Reserve Radio Club at the Naval Depot, Port Adelaide SA. (several QSLs dated 1935). Like amateur radio QSL cards, the above are all part of the fascinating history behind QSL cards.

Author's note

As an interested reader of this series of articles on the story behind QSL cards, would you like to add your name to the hundreds of other amateurs who have contributed cards to the collection? All donations are acknowledged personally as well as being recorded in this column. Please contact the author, who is also the honorary curator of the collection. Arrangements can be made for the delivery of sizeable donations. Please help in this worthwhile project.

Thanks

The WIA (Vic Div) would like to express its thanks to the following for their generous donations of QSL cards: (supplementary list)

Chas	VK7CH
Bill	VK2WS
'Snow'	VK3MR
Mike	VK6HD
Garnet	VK3MTA
Eric	VK4XN
Brian	VK4LV

Also to the family and friends of the following "Silent Keys" (supplementary list)

Joe Brown	VK7BJ via courtesy of Chas VK7CH
Derek Baker	VK3IL (ex G3NP)
Graham Colley	VK3QZ

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2930

HMAS DIAMANTINA/VMF8 AS SHE WAS IN 1945

Spotlight on SWLing

Robin L Harwood VK7RH *

In last month's column, I did mention that Radio WEWN in Birmingham, Alabama was having some serious RFI problems in the community. Well, this Catholic religious broadcaster seems to have overcome these temporary problems and is now back on-air. I'm hearing it at around 0655 UTC on 7465 kHz when they have a short 5 minute English talk, before going into Dutch. Most of the program content revolves around the Catholic Rosary.

The new Clinton Administration in America has severely curtailed funding for their surrogate broadcasters based in Munich, Germany.

This service was created at the height of the Cold War to broadcast news of what was happening inside Eastern Europe and the Soviet Union. Known as "Radio Free Europe" and "Radio Liberty", the station came under constant severe jamming until 1987 when it was lifted as part of "Glasnost". As a result of the momentous political changes in Europe in 1989-91, we have seen the mushrooming growth of an independent print and electronic media. RFE/RL is now being openly relayed inside their target areas over medium wave and FM transmitters. Therefore the Administration sees no further need to fund it beyond 1995, when it is expected that RFE/RL could be off-air.

The other surrogate broadcaster sponsored by the Americans is "Radio Marti". This Spanish language station broadcasts to Cuba around the clock from Washington via the Voice of America transmitters on both medium and shortwave. "Radio Marti" is a part of the VOA output as is a TV service in Florida, which has a sender mounted up from a tethered balloon at a high altitude. It broadcasts from 3 am to 6 am Havana time. However, there are few viewers there as the Cubans have mounted a sophisticated jamming campaign. Yet the sizeable Cuban expatriate community in Florida do indeed support it and won't allow it to be closed.

There are other clandestine anti-Castro operators about and are easily heard on shortwave. "La Voz del C.I.D." has been around for over a decade and is rumoured to be located in Central America. You can hear it on 6305 kHz from 0700z until 1200z as well as on 7385 kHz, where it is weaker. Another station is "Radio Caiman" around 9965 kHz. It too is believed to be in Central America. The best time to catch this one is around 1200z. These two stations regard the official "Radio Marti" as being too tame. Other anti-Castro organisations are quite content to hire air time over American commercial and religious broadcasters on HF plus over numerous AM/FM outlets in Florida.

The BBC External Services re-introduced Albanian on the 28th of February, after a 26 year break. Many will recall that Albania was a closed country for 40 years under the hardline Marxist dictator, Enver Hoxha. Their shortwave voice "Radio Tirana" was perhaps the most boring station ever on shortwave over that period. Tirana was easily heard by many

amateurs as it used to pop up on our exclusive allocations on 20 and 40 metres. Now you're lucky if you are able to hear it as the shortwave service has all but disappeared. The "Beeb" will ironically be utilising that 1200 KW MW sender in Albania that had a hefty signal in SE Europe. There are sizeable Albanian minorities in the Kosovo region of Serbia and in Macedonia.

A number of independent stations in the Russian Federation have recently closed down, not because of political pressure, but because of their inability to pay the required fees to the various transmitter sites. Included in this is "Radio Ala" which was popular because of their folk music. In the former Soviet Union, there are hundreds of broadcasting sites and many broadcasters have found it cheaper to lease time over these sites, rather than installing their own. But as you are probably aware, these nations are pressed for hard currency and no cash no leases is the policy. Even Radio Moscow World Service reportedly is in financial trouble coming up with the cash

to the operators of these sites. That is why the religious organisations are leasing these sites as they can pay cash, as are the western broadcasters such as Deutsche Welle, the BBC, VOA and Radio Netherlands, etc.

In conclusion, here are a few brief snippets.

Argentina's external service was recently monitored here at 0900z on 11710 kHz in Spanish to Japan. Signals were good.

North Korea is now jamming all broadcasts on shortwave in Korean. The VOA and the South Koreans have noted a dramatic increase as from November 1992.

The Belgian broadcaster "Radio Vlaanderen-Radio Flanders International" is well heard here at 0630z on 9905 in English. On Sundays, there is a short DX program — "Radio World". The VOA and Kol Israel have abandoned plans to establish an HF site for VOA/RL in the Negev Desert in Israel. This apparently upset the environmentalists who were worried about it upsetting the flight paths of thousands of migratory birds from Asia to Africa, who pass over the site. The VOA have a better site in mind — Kuwait.

Well, that is all for this month. Don't forget, you can leave messages on Packet as follows:

*2 Connaught Crescent West Launceston Tas 7250
ar

Technical Correspondence

10 Gigahertz Hurts!

A safety note for those of you experimenting in the 3cm amateur band. We've been advised by Mark VK2XOF of the Gladysville ARC, and by Lyle VK2ALU of the WIA Federal Technical Advisory Committee, that some amateurs have recently obtained telluroimeters with a view to conducting experiments around 10GHz.

Please be aware that a safety hazard exists with any equipment operating at these frequencies, especially when operating in enclosed areas, and where children may gain access to the equipment.

At all times avoid looking into the open end of the waveguide, and make sure curious children do likewise, as serious eye damage can result.

Mark Blackmore VK2XOF and
Lyle Patison VK2ALU

Baycom Review Update

As a consequence of the review of the Baycom packet modem which appeared in the January 1993 issue of AR, the Australian Amateur Packet Radio Association (AAPRA) has received responses which suggest that some points need further clarification.

1. The Baycom software as presently developed will run only on an IBM-compatible computer.
2. The Baycom modem is supplied with a copy of Baycom s/w Ver 1.5 which is registered by the authors in Germany and is obtainable from AAPRA, the only authorised distributor in Australia.
3. The price of the modem, ver 1.5 software and a comprehensive Australian manual is \$190, which also includes 12-months membership of AAPRA.
4. A registered copy of the Ver 1.5 software and the manual is available from AAPRA at a cost of \$25.

To place an order or to obtain further information about the Baycom program, please address: The Secretary AAPRA, 59 Westbrook Av, Wahroonga, NSW 2076.

When ordering, please specify size of disk required, and include an SASE if a reply by mail is necessary.

Geoff Page VK2BQ
ar

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reverse of the
Amateur Radio
address
flysheet.**

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum usable frequency); the third column the signal strength in dB relative to 1 μ V (dBu) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μ V in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point

"standard" where S9 is 50 μ V at the receiver's input and the S-meter scale is 6 dB per S-point.

μ V in 50 Ohms	S-points	dB(μ V)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W

transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

All circuits are short path unless stated as long path (LP).

The sunspot number used in these calculations is 71.4 while the predicted value for May is 68.6 and for June it is 65.6.

VK EAST AFRICA

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1	12.9	11	9.4	10	11	12	-8	-24
2	12.9	8	9.9	8	3	-5	-18	-35
3	12.5	2	9.5	4	1	-6	-20	-36
4	15.5	4	11.8	1	4	0	-7	-19
5	12.5	5	12.5	2	1	-1	-2	-3
6	25.3	7	18.6	4	7	9	7	2
7	25.4	7	19.0	4	7	9	7	3
8	23.7	8	18.9	0	9	9	6	1
9	21.5	9	17.0	4	10	9	4	-3
10	19.2	9	15.1	7	10	7	0	-9
11	19.3	13	11.3	11	10	14	-2	-27
12	15.1	13	11.9	13	11	14	-2	-27
13	13.9	17	11.0	16	8	-2	-18	-36
14	13.2	21	10.4	19	7	-6	-24	-44
15	12.6	26	10.0	21	5	-8	-29	-51
16	12.0	27	9.5	21	5	-10	-32	-53
17	12.0	21	9.1	21	5	-13	-36	-57
18	11.5	31	8.5	20	1	-17	-	-
19	10.9	31	8.1	16	-2	-22	-	-
20	11.4	31	8.0	19	0	-18	-	-
21	11.3	30	7.8	19	-1	-19	-	-
22	12.8	28	7.2	15	-4	-22	-	-
23	10.4	19	7.4	10	-7	-24	-	-
24	11.0	14	7.9	9	-4	-19	-	-

VK EAST EUROPE L/P

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	10	10.1	10	8	2	-7	-20
2	14.6	12	9.9	12	8	1	-10	-23
3	14.2	14	9.8	14	9	1	-12	-27
4	13.5	16	9.4	17	8	-1	-16	-33
5	13.0	20	9.0	20	8	3	-20	-40
6	13.5	25	7.7	23	11	0	-17	-36
7	15.5	22	11.3	25	15	7	-6	-21
8	18.7	19	10.5	25	21	14	5	-6
9	15.9	17	12.2	17	17	8	-1	-13
10	15.0	9	11.5	9	8	3	-17	-30
11	14.7	11	11.2	8	2	0	-20	-33
12	13.8	13	10.9	2	1	2	-10	-23
13	13.2	-9	10.4	-6	-1	-3	-11	-21
14	12.9	-13	10.1	-8	-2	-4	-11	-20
15	12.6	-17	9.7	-9	-2	-4	-10	-20
16	12.0	-21	9.2	-9	-3	-4	-11	-21
17	12.0	-25	8.9	-9	-3	-4	-11	-21
18	11.5	-28	8.5	-9	-3	-4	-11	-21
19	11.8	-21	8.9	-9	-3	-4	-11	-21
20	14.2	-11	11.1	-11	-2	-3	-8	-25
21	18.3	-1	14.0	-12	-1	0	-2	-7
22	20.0	3	13.5	-9	1	3	1	-3
23	22.0	8	12.2	-3	4	4	0	-4
24	23.7	6	11.8	2	6	4	0	-4
25	24.8	8	10.6	8	7	3	-5	-18

VK EAST ASIA

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1	30.6	15	11	19	21	19	15	15
2	31.1	13	24.1	9	19	20	17	17
3	31.4	13	24.1	9	18	21	20	17
4	31.9	13	26.6	10	19	21	20	17
5	32.4	13	26.6	12	21	22	21	18
6	31.7	14	25.8	16	23	24	22	18
7	30.2	14	25.8	20	25	27	22	18
8	28.2	16	23.7	30	28	22	16	12
9	26.3	19	20.9	41	35	30	22	14
10	24.1	20	19.2	41	34	28	18	8
11	22.4	21	17.8	41	32	25	14	2
12	21.5	22	17.4	41	31	23	11	-1
13	19.7	26	16.4	40	35	21	8	-5
14	19.7	23	15.8	39	28	18	4	-10
15	18.5	23	14.6	37	25	14	-1	-17
16	17.7	24	13.8	35	22	10	-6	-24
17	16.1	25	12.5	32	17	3	-16	-37
18	13.9	26	10.8	35	5	-11	-35	-
19	13.3	26	10.3	22	17	-17	-	-
20	14.7	26	11.4	28	11	-4	-26	-
21	18.8	21	14.9	32	23	14	-1	-14
22	26.8	16	20.8	25	28	24	19	13
23	29.4	14	23.6	18	24	23	20	15
24	29.6	13	24.3	14	21	22	19	15

VK EAST MEDITERRANEAN

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1	16.0	8	12.2	10	8	2	-5	-18
2	15.3	1	11.6	-1	3	0	-7	-17
3	19.0	3	14.3	-8	2	3	0	-6
4	25.4	6	19.5	-16	0	6	7	4
5	30.7	8	24.0	-21	-1	6	9	9
6	31.0	7	25.5	-22	-1	5	9	8
7	29.0	7	24.3	-20	0	6	9	8
8	28.2	7	22.7	-15	2	7	9	7
9	25.9	8	21.8	-7	6	9	6	6
10	23.6	10	18.7	1	10	11	8	3
11	21.2	11	16.8	8	13	11	6	-1
12	19.3	14	15.5	15	11	4	-4	-1
13	18.2	12	14.4	21	18	12	2	-10
14	17.4	21	13.8	26	20	11	0	-14
15	17.4	24	13.3	30	20	10	-3	-19
16	16.0	26	12.6	31	18	8	-6	-23
17	15.5	27	12.1	31	18	7	-9	-27
18	14.5	24	11.6	29	15	5	-10	-36
19	13.0	30	10.0	25	9	-6	-27	-
20	12.9	30	9.9	25	9	-6	-27	-
21	15.9	27	12.6	32	20	9	-7	-24
22	17.2	25	13.3	31	23	14	-2	-12
23	16.3	20	12.5	22	17	9	-2	-16
24	18.5	15	14.3	16	16	11	3	-6

VK EAST USA/CARIBBEAN

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1	12.4	2	12.4	11.6	31	19	7	-9
2	12.4	11	11.7	0	11	14	13	10
3	12.4	19	11.8	34	23	13	0	15
4	12.7	21	11.7	34	23	13	0	15
5	13.4	27	11.2	34	23	13	0	15
6	14.5	29	11.0	34	23	13	0	15
7	14.5	23	11.0	35	23	13	0	15
8	14.5	23	11.0	35	23	13	0	15
9	14.5	23	11.0	35	23	13	0	15
10	15.1	29	11.6	31	19	7	-9	-28
11	15.1	21	11.7	0	11	14	13	10
12	15.4	29	11.8	34	23	13	0	15
13	15.4	27	11.7	34	23	13	0	15
14	16.5	23	11.0	35	23	13	0	15
15	15.2	19	11.8	21	14	5	-8	-24
16	14.7	22	11.4	21	13	12	8	0
17	13.0	3	10.0	25	15	5	-10	-36
18	13.0	2	9.5	25	15	5	0	-7
19	15.8	12.0	4	16.8	-11	1	4	-2
20	21.5	4	16.8	-11	1	4	2	-2
21	26.4	6	20.7	-17	0	5	6	4
22	28.8	6	23.0	-20	1	5	7	6
23	29.7	7	24.1	-20	0	6	8	7
24	30.7	7	24.8	-17	1	7	10	9

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	18	9.3	17	-4	-22		
2	13.1	15	10.0	14	6	-4	-20	-38
3	16.3	13	12.9	14	11	5	-5	-18
4	22.3	12	17.2	11	15	13	8	1
5	26.4	18	19.2	12	19	10	5	5
6	26.4	8	19.2	3	11	12	9	3
7	26.0	8	18.8	1	10	12	9	3
8	25.0	8	17.9	3	11	12	9	3
9	23.6	9	16.7	6	12	12	8	1
10	21.9	15	15.1	10	13	11	5	3
11	19.3	12	15.5	13	11	9	3	1
12	17.1	14	11.9	16	12	6	-6	-19
13	15.2	17	10.5	18	10	0	-14	-31
14	13.9	20	9.6	20	8	-4	-22	...
15	13.0	25	9.8	21	6	-9	-30	...
16	12.4	25	8.2	20	3	-13	-36	...
17	12.0	26	8.3	21	7	...	...	...
18	11.5	30	8.0	18	2	-21	...	...
19	11.1	30	7.9	16	-4	-24	...	...
20	10.8	30	7.8	15	-7	-27	...	...
21	11.5	30	8.3	18	-2	-21	...	...
22	11.6	30	8.1	19	-9	...	27	...
23	11.1	26	7.9	15	-3	-22	...	...
24	11.7	24	8.5	15	0	-16	-38	...

VK SOUTH StH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	23	18	19.6	23	23	19	11
2	24.0	24	15.5	20.4	24	24	20	12
3	24.0	15	20.5	21	25	20	13	3
4	23.9	16	19.8	27	26	21	13	3
5	23.5	16	19.8	31	28	22	13	3
6	23.2	18	20.0	30	37	23	12	0
7	20.2	23	16.1	38	29	19	-7	-19
8	18.2	24	14.4	36	25	13	-2	-19
9	16.2	26	12.8	33	19	5	-13	-34
10	14.5	28	11.5	30	12	-3	-26	...
11	13.0	29	10.5	28	12	-5	-35	...
12	12.4	30	9.8	22	6	-21	...	...
13	11.7	31	9.3	19	-5	-27	...	...
14	11.3	32	8.6	16	-9	-32	...	...
15	11.0	32	8.7	15	-11	-35	...	...
16	10.8	32	8.5	13	-13	-39	...	...
17	10.2	33	7.3	10	-15	-42	...	...
18	9.7	34	7.4	6	-25	...	...	...
19	10.1	31	7.6	8	-20	...	...	...
20	12.0	22	9.0	15	-3	-23	...	...
21	15.6	18	11.9	21	11	0	-18	-37
22	16.8	18	11.9	21	18	11	-1	-15
23	21.6	12	17.2	23	16	7	4	...
24	22.7	15	18.5	23	23	18	10	0

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	4	9.3	-4	-9.3	-3	1	-15
2	12.9	5	8.1	-1	-9.0	1	-1	-19
3	12.5	6	7.8	-1	-8.9	3	-1	-22
4	12.0	7	7.2	-1	-8.7	5	-1	-23
5	11.7	8	6.7	-1	-8.5	7	-1	-24
6	11.5	9	6.1	-1	-8.3	9	-1	-25
7	11.3	10	5.6	-1	-8.1	11	-1	-26
8	11.2	11	5.1	-1	-7.9	13	-1	-27
9	11.1	12	4.6	-1	-7.7	15	-1	-28
10	11.0	13	4.1	-1	-7.5	17	-1	-29
11	10.9	14	3.6	-1	-7.3	19	-1	-30
12	10.8	15	3.1	-1	-7.1	21	-1	-31
13	10.7	16	2.6	-1	-6.9	23	-1	-32
14	10.6	17	2.1	-1	-6.7	25	-1	-33
15	10.5	18	1.6	-1	-6.5	27	-1	-34
16	10.4	19	1.1	-1	-6.3	29	-1	-35
17	10.3	20	0.6	-1	-6.1	31	-1	-36
18	10.2	21	0.1	-1	-5.9	33	-1	-37
19	10.1	22	-4.9	-1	-5.7	35	-1	-38
20	10.0	23	-9.4	-1	-5.5	37	-1	-39
21	9.9	24	-13.9	-1	-5.3	39	-1	-40
22	9.8	25	-18.4	-1	-5.1	41	-1	-41
23	9.7	26	-22.9	-1	-4.9	43	-1	-42
24	9.6	27	-27.4	-1	-4.7	45	-1	-43
25	9.5	28	-31.9	-1	-4.5	47	-1	-44
26	9.4	29	-36.4	-1	-4.3	49	-1	-45
27	9.3	30	-40.9	-1	-4.1	51	-1	-46
28	9.2	31	-45.4	-1	-3.9	53	-1	-47
29	9.1	32	-49.9	-1	-3.7	55	-1	-48
30	9.0	33	-54.4	-1	-3.5	57	-1	-49
31	8.9	34	-58.9	-1	-3.3	59	-1	-50
32	8.8	35	-63.4	-1	-3.1	61	-1	-51
33	8.7	36	-67.9	-1	-2.9	63	-1	-52
34	8.6	37	-72.4	-1	-2.7	65	-1	-53
35	8.5	38	-76.9	-1	-2.5	67	-1	-54
36	8.4	39	-81.4	-1	-2.3	69	-1	-55
37	8.3	40	-85.9	-1	-2.1	71	-1	-56
38	8.2	41	-90.4	-1	-1.9	73	-1	-57
39	8.1	42	-94.9	-1	-1.7	75	-1	-58
40	8.0	43	-99.4	-1	-1.5	77	-1	-59
41	7.9	44	-103.9	-1	-1.3	79	-1	-60
42	7.8	45	-108.4	-1	-1.1	81	-1	-61
43	7.7	46	-112.9	-1	-0.9	83	-1	-62
44	7.6	47	-117.4	-1	-0.7	85	-1	-63
45	7.5	48	-121.9	-1	-0.5	87	-1	-64
46	7.4	49	-126.4	-1	-0.3	89	-1	-65
47	7.3	50	-130.9	-1	-0.1	91	-1	-66
48	7.2	51	-135.4	-1	0.1	93	-1	-67
49	7.1	52	-139.9	-1	0.3	95	-1	-68
50	7.0	53	-144.4	-1	0.5	97	-1	-69
51	6.9	54	-148.9	-1	0.7	99	-1	-70
52	6.8	55	-153.4	-1	0.9	101	-1	-71
53	6.7	56	-157.9	-1	1.1	103	-1	-72
54	6.6	57	-162.4	-1	1.3	105	-1	-73
55	6.5	58	-166.9	-1	1.5	107	-1	-74
56	6.4	59	-171.4	-1	1.7	109	-1	-75
57	6.3	60	-175.9	-1	1.9	111	-1	-76
58	6.2	61	-180.4	-1	2.1	113	-1	-77
59	6.1	62	-184.9	-1	2.3	115	-1	-78
60	6.0	63	-189.4	-1	2.5	117	-1	-79
61	5.9	64	-193.9	-1	2.7	119	-1	-80
62	5.8	65	-198.4	-1	2.9	121	-1	-81
63	5.7	66	-202.9	-1	3.1	123	-1	-82
64	5.6	67	-207.4	-1	3.3	125	-1	-83
65	5.5	68	-211.9	-1	3.5	127	-1	-84
66	5.4	69	-216.4	-1	3.7	129	-1	-85
67	5.3	70	-220.9	-1	3.9	131	-1	-86
68	5.2	71	-225.4	-1	4.1	133	-1	-87
69	5.1	72	-229.9	-1	4.3	135	-1	-88
70	5.0	73	-234.4	-1	4.5	137	-1	-89
71	4.9	74	-238.9	-1	4.7	139	-1	-90
72	4.8	75	-243.4	-1	4.9	141	-1	-91
73	4.7	76	-247.9	-1	5.1	143	-1	-92
74	4.6	77	-252.4	-1	5.3	145	-1	-93
75	4.5	78	-256.9	-1	5.5	147	-1	-94
76	4.4	79	-261.4	-1	5.7	149	-1	-95
77	4.3	80	-265.9	-1	5.9	151	-1	-96
78	4.2	81	-270.4	-1	6.1	153	-1	-97
79	4.1	82	-274.9	-1	6.3	155	-1	-98
80	4.0	83	-279.4	-1	6.5	157	-1	-99
81	3.9	84	-283.9	-1	6.7	159	-1	-100
82	3.8	85	-288.4	-1	6.9	161	-1	-101
83	3.7	86	-292.9	-1	7.1	163	-1	-102
84	3.6	87	-297.4	-1	7.3	165	-1	-103
85	3.5	88	-301.9	-1	7.5	167	-1	-104
86	3.4	89	-306.4	-1	7.7	169	-1	-105
87	3.3	90	-310.9	-1	7.9	171	-1	-106
88	3.2	91	-315.4	-1	8.1	173	-1	-107
89	3.1	92	-319.9	-1	8.3	175	-1	-108
90	3.0	93	-324.4	-1	8.5	177	-1	-109
91	2.9	94	-328.9	-1	8.7	179	-1	-110
92	2.8	95	-333.4	-1	8.9	181	-1	-111
93	2.7	96	-337.9	-1	9.1	183	-1	-112
94	2.6	97	-342.4	-1	9.3	185	-1	-113
95	2.5	98	-346.9	-1	9.5	187	-1	-114
96	2.4	99	-351.4	-1	9.7	189	-1	-115
97	2.3	100	-355.9	-1	9.9	191	-1	-116
98	2.2	101	-360.4	-1	10.1	193	-1	-117
99	2.1	102	-364.9	-1	10.3	195	-1	-118
100	2.0	103	-369.4	-1	10.5	197	-1	-119
101	1.9	104	-373.9	-1	10.7	199	-1	-120
102	1.8	105	-378.4	-1	10.9	201	-1	-121
103	1.7	106	-382.9	-1	11.1	203	-1	-122
104	1.6	107	-387.4	-1	11.3	205	-1	-123
105	1.5	108	-391.9	-1	11.5	207	-1	-124
106	1.4	109	-396.4	-1	11.7	209	-1	-125
107	1.3	110	-400.9	-1	11.9	211	-1	-126
108	1.2	111	-405.4	-1	12.1	213	-1	-127
109	1.1	112	-409.9	-1	12.3	215	-1	-128
110	1.0	113	-414.4	-1	12.5	217	-1	-129
111	0.9	114	-418.9	-1	12.7	219	-1	-130
112	0.8	115	-423.4	-1	12.9	221	-1	-131
113	0.7	116	-42					

Silent Keys

Due to increasing space demands, obituaries should be no longer than 200 words.

The WIA regrets the passing of :		
R E	Palmer	VK2KRP
R A J (Roy)	Taylor	VK2TR
B (Basil)	Rogers	VK3ABJ
H (Henry)	Denver	VK3AHQ
G L (Godfrey)	Barthold	VK3BT
E C (Ed)	Graham	VK3JAA
B A (Tiny)	Wendt	VK4ATI
C W (Wally)	Mann	VK5DF
G B (Geoffrey)	Widnall	VK6GZ
H J	Griffiths	VK6HB
E T	Potter	VK6ZO
H H	Fietz	VK7HH

Our most sincere condolences to his daughter Lee-Ann.
Vale Tiny Wendt VK4ATI.
David Jones VK4OF and friends

L A Maschette VK6KWN

Amateur radio has lost a "character". Alyn Maschette, born at Harvey WA in 1932, worked (and played) in two or three states, served in the RAAF, had a number of callsigns (at least one of which he claimed to have invented!), loved life, and was generous to a fault. Westlakes Radio Club knew him; so too did WA groups such as VHF, repeater and digital clubs. He loved the hobby and seemed never to tire of promoting it. His other love was Rostrum, and appropriately enough, he loved and stoutly defended the English language. Indeed Alyn would pick a (verbal) fight with anyone or anybody (corporate or otherwise) if he thought someone was doing somebody else wrong!

In spite of severe health problems over recent years, Alyn never let go of his love of life and family.

His battle ended, however, at 1am on Monday 8/2/93 in Royal Perth Hospital when the last and most severe of a series of heart attacks called QRT for VK6 "kind, wise and nice".

Harry Atkinson VK6WZ
5/97 Railway Parade
Mt Lawley WA 6050

Roy Taylor VK2TR, 1926-1993

Roy was born in Cremorne NSW. He attended Marconi School of Wireless where he sat for his first class, second class and broadcast licences. He also obtained his licence as a commercial radio operator in 1944.

Roy worked for several radio stations in NSW and Queensland, including Kempsey, Mackay and Ayr. He also worked for the Flying Boat Air Radio Base at Karumba. After leaving Karumba he worked for 4VL Charleville, where he met Billie, who was on a working holiday with her brother. Roy and Billie were married in Melbourne in 1948.

Roy's love of radio, in particular broadcasting, led him to a position in Bega with 2BE (now 2EC) in 1949, where he stayed until 1951. For the next 12 years Roy and his family lived in Papua New Guinea where he operated radio circuits and coastal radio for the Department of Posts and Telegraphs. Returning to Australia in 1963, Roy worked for 2BE for 10 years before moving to Cooma (2XL) until his retirement.

Roy passed on his interest in amateur radio to his son Steve VK2EDH, daughter Mandy VK2MFG, and son-in-law Kevin VK2NBW.

Roy passed away peacefully on 1 February 1993 after a short illness. Sadly missed by us all.

Billie Taylor

Godfrey Lewis Barthold VK3BT

Godfrey Barthold, one of the early amateur broadcasters, died on 22 February 1993, aged 93.

He was educated at Caulfield Grammar School and went on to study accountancy. He qualified in 1924.

By that time, Godfrey had become interested in radio through his friend the late Keith Ballantyne (VK3AKB) and together they formed the Radio Equipment and Service Company.

Godfrey obtained his amateur station licence 3GL in 1925, and was soon on the air broadcasting speech and music when the commercial stations were off the air on Sundays. His many signal reports attest to the high standard of his transmissions.

In 1927 Keith sold his interest in the Company to Godfrey.

Godfrey's callsign was changed to 3BT and 3GL was allocated to a Geelong commercial station.

In 1933 Godfrey married Miss Jessie McKenzie and they built a house in Glen Iris.

The Company's post war production included original parts for VW and other vehicles.

After the war, things were different radio-wise.

Denied the opportunity to broadcast, Godfrey used his equipment mainly as a means of keeping in touch with his radio friends.

Godfrey was a member of the WIA and the Radio Amateur Old Timer's Club.

He was predeceased by his wife; he leaves two daughters, one son, eight grandchildren, and many great grandchildren.

Godfrey will be sadly missed.

Dudley Cutler VK3ZDC

Editors Note: Last month, several lines from the Obituary in respect of Harry Hocking were inadvertently omitted, and the entire Obituary is now published below. We extend our apologies to the authors, and in particular to Harry's family ... VK3ABP.

Harry Hocking VK2HH

It is with regret we record the passing of Harry Hocking VK2HH on 9 December 1992 at the Calvary Hospital, Kogarah, after a short and sudden illness, at the age of 72 years.

Harry trained at the Marconi School of Wireless in Sydney, then made his career as a professional radio officer. First serving a few years in the Merchant Marine in WWII before being appointed by Qantas as an RO, flying first in Catalina then Sunderland flying boats.

He continued this career through various Qantas aircraft until the use of radio officers was discontinued with the advent of the 747.

Harry continued on ground-based training duties, but with many interesting flights to evaluate new radio systems.

When QANTAS initiated the first Jumbo 747 passenger trips to Antarctica, Harry was again "air-borne" and the call "VK2HH Aeronautical Mobile/Antarctica" brought responses from many joyful DXers.

Retirement in 1980 ended 36 years with QANTAS and allowed Harry to develop his many overseas contacts with whom he could have, in his words, "A good chin-wag". He will be sadly missed from our skeds, and we pass our condolences to his XYL, Jean.

George VK2UN
Bill VK4WMG/2JJ
AH VK2GVT
Ben VK2AJE
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Over to You

Restoration of Beaufort A9-557

Jack White, curator of aircraft at the War Museum, Canberra is restoring A9-557, a Beaufort which flew with 100 Squadron. It crashed at TADJU (Aitape) in late 1944 (no brakes, no flaps as a result of enemy action over Boram air strip — Wewak area).

Jack would appreciate donations of any parts salvaged, "won" or otherwise acquired from the interior of any Australian made Beaufort (700 of them were made).

In particular he requires radio (AT5-AR8, ATU, Genemotors and Cables and Plugs) and radar units (ASV — transmitter/receiver/display unit, S-O-H switch), IFF set, DF loop controls, plugs and cables, voltage regulators and other wall furniture from the Wop's compartment, Navigator's instrument panel, bomb distributor fusing switches, drift recorder, Astro Compass, 02 or 06 compass, flame floats, aluminium sea markers, "R3003 only" and so on ad infinitum.

There must be lots of bowerbirds who, unlike me, haven't disposed of gadgetry because of multiple job-related shifts.

Could you please direct a plea for amateurs and others to search through their junk boxes to root out these now valuable bits and pieces, and send them to:

Mr Jack White
Curator of Aircraft
Australian War Museum
Canberra ACT.

Alan Gardner VK4BWG
40 Wattle Avenue
Bribie Island Q 4507

EMI and Telephones

The article in WIA News (March 1993) concerning EMI and telephones raises important issues, and not just for amateurs.

While working for ABC radio I am reminded of a call I received from a listener living at St Albans (Melbourne). Unfortunately our listener just happened to live "cross the road" from 3LO, 3RN and 3PB transmitting station!

WICEN

News from WICEN (NSW) Inc

The now-annual Co-ordinators' Meeting will be held at Goulburn Police Academy on the weekend of 15-16 May, and all WICEN personnel are invited to attend for a nominal fee.

All WICEN personnel are reminded that the only postal contact with WICEN (NSW) Inc is PO Box 123, St Leonards 2065; all other addresses are "null and void".

WICEN (NSW) conducts nets at various times; the most prominent are the Sydney VHF Net every Thursday night at 2130 on repeater 7150 (in Chatswood), and a statewide HF net every Tuesday night on 3.615 MHz at 2030.

Dave Horsfall VK2KFU, Publicity Officer,
WICEN (NSW) Inc

The caller phoned us in desperation — can you help us eliminate the 3LO signal from our telephone? She explained that Telecom had checked her phone and was told nothing could be done. Reluctantly, I had to explain that the fault is with the phone system. (Her sons didn't mind — they could pick up the phone when the cricket was on and get the score).

It seems that many "technical type" people, and not just in Telecom, haven't a clue when it comes to RF. Let's hope that engineers within Telecom with EMI experience point out the radio frequency facts of life to their managers.

Stolen Equipment

One Kenwood TM221A 2M FM transceiver, serial number 8022576.

GME TX472S, 40 channel UHF transceiver, serial number 006-62229.

Owner Gerald Q Badcock VK7GO, RSD 740, Exton 7303. Tel (003) 62 2328. Police contact: Const Mick Coull, Carrick Police. (003) 93 6112. No distinguishing features on either sets. Equipment was stolen from radio shack on 15/2/93 at the above address.

Stolen from VK3KC's property at Clunes (nr Ballarat Vic)

Sharp Tape recorder.

Slow Scan mono TV system housed in a grey

And while on this topic may I tell a tale about ABC Radio in Melbourne?

Readers may recall the ABCs Picnics in the Park — our big PR day.

Well Melbourne had theirs on March 7th.

As part of the display a temporary FM station was set up in the gardens. Guess what happened?

An outside broadcast mixer — a special, all singing, all dancing, state-of-the-art unit, designed for us, suffered severe EMI from the Tx on 94.1 MHz, AND IT WAS ONLY 5 WATTS! You would think we would have required EMI rejection as part of the design specs — after all it was to be used by a RADIO STATION!

Dallas James VK3AMU
13 McKay Street
Essendon Vic 3042

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steel box 15" x 15" x 4". This was a 110/12v commercial SSTV surveillance system, a ROBOT clone, modified for amateur use.

B and W Video camera, marked "VK3KC" on both sides.

Large Zoom lens "C" mount.
240/110v transformer PSU.

7" mono monitor, 110/12v.
Microphone.

Folders on operation of Robot 400 and Aciton xcvr circuitry.

Hills XG-14 TV antenna.
Details to K1 Codlin VK3KC RMD 4601 Moe South Road, Moe South 3825

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"YL station here. Name is Ermintude. Won a beauty contest today. First prize was an FT1000 and a three element beam".

CONTESTS

Peter Nesbit VK3APN *

Contest Calendar Apr-Jun 93

Apr 1	Poisson d'Avril	(Mar 93)
Apr 3/4	SP DX	(Mar 93)
Apr 9/11	Japan DX CW	(Mar 93)
Apr 10/11	"King of Spain"	(Mar 93)
Apr 17/18	SARTIG AMTOR	(Mar 93)
Apr 24/25	Helvetica (Swiss) CWSSB	(Apr 93)
May 1/2	ARI (Italy) CW/SSB/RTTY	(Apr 93)
May 8/9	CO-M (Russia)	(Apr 93)
May 29/30	CO WPX CW	(Mar 93)
Jun 5/6	RSGB Field Day CW	
Jun 12/13	ANARTS (VK) RTTY	
Jun 26/27	ARRL Field Day	

One of the problems experienced each month by your columnist is the difficulty of fitting all the rules of relevant contests, together with results, into the space available. Whilst attempting to perform this herculean task, it has become evident that most contests share similar rules, to the extent that a set of general rules and definitions for HF contests has now been identified and written.

These will undoubtedly evolve further. They are however a start, and hopefully contest organisers in this and other countries can be encouraged to move towards the adoption of standard rules and definitions, without sacrificing the "flavour" of their particular contest.

The advantage to entrants is that they will know more precisely what is required of them, both in contest operation and log submission, and that their entries will be treated fairly and penalties avoided.

The General Rules and Definitions will be presented at least once a year, and I suggest you copy them for easy reference over the ensuing months. They should be read in conjunction with the rules for overseas contests, which from now on will be more heavily abbreviated in this column to conserve space and enable other information of interest to appear.

Your comments are invited. Until next month, good contesting!

Bands

Unless otherwise stated, HF contests will use 1.8-30 MHz, except 10, 18 & 24 MHz. Some contests limit operation to certain segments of the band (eg for CW, the bottom 25 or 30 kHz, novice contacts excepted). Crossband contacts are not permitted, although contacts between stations using different parts of the same band are permitted. Except for single band contests, most contests provide separate categories for multiband and single band entries.

Band Changes

In some contests, to prevent rapid band hopping which may become tantamount to multi-transmitter operation, once a transmitter has begun operating on a particular band, it must not change band until at least 10 minutes have elapsed (sometimes called the "10 Minute Rule"). This rule only applies if stated.

Modes

Unless otherwise stated it can be assumed that both phone and CW contacts are allowed, but crossmode contacts are not.

Categories

Only single operator entries will be accepted unless otherwise stated. Single operator stations are where one person performs all operating, logging, and spotting functions. Some contests call this "single operator unassisted".

If any assistance is received from spotting nets or other alerting systems not physically located at the station, including telephone, the operator must enter the all band single operator assisted category (if allowed for the particular contest), or failing that, the multi-operator category.

Multi-operator stations are where more than one person operates, checks for duplicates, keeps the log, etc. In this category, some contests also distinguish between single transmitter and multi-transmitter stations ("multi-single" and "multi-multi" respectively). Single transmitter stations are where only one signal is transmitted at any one time. Two transmitter stations are where two signals are transmitted at any one time. Unlimited stations are where a maximum of one signal per band is transmitted. In the multi-operator category, once a transmitter has begun operating on a band, it must not change band until the time specified in the "Band Changes" rule has elapsed. Listening time counts as operating time.

Multi-transmitter stations must have all operating equipment including antennas located within a 500m diameter circle or the property limits of the licensee's address, whichever is greater. All antennas must be physically connected by wires to the station transmitters and receivers, precluding the use of remote receiving facilities (except for spotting nets or other alerting systems, if allowed by the rules).

Unless otherwise certified on the summary sheet, an entry from a club, group, or organisation will be considered multi-operator by default.

Power

Some contests provide categories for output power, which are commonly 5W (QRP), 100W ("low power"), and unrestricted. Power categories apply only if stated.

Portable Stations

A station entering the portable category of a contest must use portable field equipment operating from a power source which is independent of any permanent facilities, eg batteries, portable generator, solar power, wind power. All equipment and antennas comprising a portable station must be located within a 300m diameter circle. None of the portable field equipment may be erected on the site earlier than 24 hours before the beginning of the contest. Entrants must operate from the same site for the whole of the contest. The portable category is available only if stated.

Receiving stations

Most contests will also accept SWL entries. Rules are generally as for transmitting stations, except that SWL logs must show the callsign of the station heard, a signal report on that station, the number sent by that station, and the callsign of the station being worked.

Callsign

A single operator may only use a callsign of which he/she is the official holder. A single operator may not use a callsign belonging to any group, club or organisation for which he/she is a member or sponsor except as part of a multi-operator entry. A multi-operator station may use only one callsign during the contest.

Solicitation of Contacts

The use of non-amateur radio means of soliciting contacts, such as telephone, is precluded. Amateur repeaters may be used to arrange a contest contact on another frequency, providing the repeater is not used for that contact. If a contact is solicited with a station who has no other contest contacts, to guard against it being disallowed as an unconfirmed contact, note in the log that it was solicited.

Contest Exchange

Unless otherwise stated, use the standard contest exchange which is RS(T) plus a 3 digit number starting at 001 and incrementing by 1 for each contact. If 999 is reached, continue to 000, then to 001 etc. Multi-transmitter stations must use separate numbers for each band starting at 001. To avoid confusion when simultaneously operating in two or more contests on the same band, it is generally acceptable to use the same set of serial numbers for both contests.

Stations in the country hosting the contest will often add a 2 or 3 letter suffix to the number indicating their county or province. In such cases, the suffix must also be copied correctly to allow full points to be claimed for the contact.

Countries and Continents

Countries are as per the ARRL DXCC list at the time of the contest, and continents as per the boundaries defined for the WAC award. Continental boundaries are shown on the "Radio Amateurs Prefix Map" published by Callbook Magazine (available through WIA). Some DX contests allow contacts with stations in one's own country for multiplier credit, but such contacts usually have zero point value. The rules will state the actual scoring method.

Multipliers

The multiplier on each band is usually the total of one or more of the following: total number of countries worked, total number of zones worked, total number of county or province codes worked. The final score then equals (total QSO points from all bands) x (multiplier from band 1 + multiplier from band 2 + ... + multiplier from band n). With single band entries, obviously only one band applies. The rules will state the actual method of calculating the multiplier and final score.

When you buy
something from one of
our advertisers, tell
them you read about
it in the WIA Amateur
Radio Magazine.

Bonuses

Some contests, mainly those sponsored by the RSGB, use bonus points instead of multipliers. In this case the bonuses are derived similarly to multipliers, but are added to the QSO points, not multiplied. The rules will state the actual method of calculating the bonuses and final score.

Information Shown in Logs

Logs must show dates and times in UTC (GMT), bands, callsigns, complete exchanges sent and received, and QSO points. Incomplete contacts must be logged with zero points claimed. Points are not lost if a non-competing station does not send appropriate information, providing the report and any other exchange is logged. An additional column must be included to show multipliers/bonuses wherever they contribute to the final score. Multi-operator stations must submit separate logs for each band.

Log Checking

Duplicate contacts must be logged with zero points claimed. Logs must also be checked for correct points and multipliers/bonuses.

Check Log

Entries with more than a certain number of contacts, (eg 80 or more for RSGB contests), must include a sorted alphanumeric list of calls (ie a "dupe" sheet) for each band. RSGB contests also require either the serial number sent or the time of contact to be included beside the callsign, plus a sorted list of multipliers or bonuses for each band.

Summary Sheet

Include a summary sheet showing the callsign used during the contest, name, mailing address, location of the station during the contest (if different to the mailing address), section (ie multiband or band used, single or multi-operator, power category if applicable etc), scoring information, and the declaration "I hereby certify that all contest rules and radio regulations were observed during the contest" with signature and date. Single band entries showing more than one band may be judged as multiband unless otherwise specified. For multi-operator entries, the summary sheet must also list the callsigns, names and signatures of all station operators.

Equipment details, plus interesting anecdotes, comments on the contest, and/or a photograph are also often invited.

Log Submission

Logs, including check logs, may be submitted either on paper, or on 3-1/2 or 5-1/4 DSK disk in a standard contest format (eg K1EA "CT" amongst others). Some contests also accept disk logs in ASCII, and common database, spreadsheet and word processor formats (check the rules). Logs submitted on disk must include a summary sheet on paper. Paper log sheets should each be headed with Contest Name, Band, Callsign, and Page x of n.

For the large contests, the inclusion of a self addressed label for the return of an award (if received) is often appreciated by the organisers. Logs are generally retained by the organisers. Indicate CW or SSB on the envelope.

The standards for logs submitted on disk will be addressed in a future column.

Deadline

To ensure that the log arrives by the specified deadline, it is advisable to send it airmail, as late logs are usually classed as check logs.

Awards

At the judges' discretion, trophies, plaques, and certificates will be awarded to the highest scoring stations in the various categories and countries. Where returns justify, 2nd, 3rd, or more awards may also be made. In some contests, to be eligible for awards, stations may need to show a certain minimum score or period of operation.

Penalties and Disqualification

Score reduction may occur for taking credit for duplicate contacts, unconfirmed QSOs and multipliers, and scoring discrepancies. Depending on the contest and the problem, penalties may range up to 15 times the QSO points.

Logs will be disqualified if duplicate contacts contribute more than 2% to the score; "rubber clocking" is detected (ie altering the recorded time so that actual operating time exceeds the allowable limit); or changing bands more rapidly than allowed (if applicable).

At the judges' discretion points may be deducted or entries disqualified for illegal or excessively untidy logs, absence of a summary sheet, breaching the rules or spirit of the contest, or evidence of single operator stations receiving significant logistic support from clubs or groups.

Disqualified stations may be banned from further participation in the contest for up to 3 years.

Any station may be approached, without notice to entrants, for confirmation of a contact.

Rule Changes

The rules for overseas contests are often not received until after the AR publishing deadline. In these instances, it usually safe to use the rules from the previous year, as changes from one year to the next are generally minimal. See also the "DATE" section above.

Helvetica Contest (Switzerland) CW/SST

When: 1300z Saturday to 13z Sunday, Apr 24/25 This is a good opportunity to pick up extra Cantons for the Helvetica Award, which requires confirmation of all 26 Cantons. General rules apply (see above). Work only Swiss stations. You may work a station only once per band, regardless of mode. Score 3 points per QSO, multiplier is total Cantons. Send log postmarked by 31 May to: USKA Traffic Manager, Walter Schmutz H89AGA, Gantrischweg 1, CH-3114 Oberwirchtrach, Switzerland.

ARI International DX Contest CW/SSB/RTTY

When: 2000z Saturday to 13z Sunday, May 1/2 This is a world wide contest, and occurs each year on the first full weekend of May. Anyone can work anyone else. General rules apply (see above). Categories are: Single operator CW, SSB, mixed, and RTTY; Multi operator single transmitter mixed; and SWL mixed. The same station can be contacted on the same band once each on CW, SSB, and RTTY, but the multiplier can be claimed only once for that band. Once a band or mode has been used, 10 minutes must elapse before it can be changed. Send RS(T) + serial number, Italian stations will send RS(T) + province.

Score 10 points per Italian QSO, 3 points per QSO with stations in another continent, 1 point per QSO with stations in own continent, and zero points per QSO with stations in own country.

Multiples are the sum of Italian provinces (max 95) and countries (excluding I and ISO) on each band. Province codes are: I1: AL AT CN GE IM NO SP SV TO VC; IX1: AO; I2: BG BS CO CR MI MN PV ME VA; I3: BL PD RO TV VE VR VI; I3N: BZ TN; IV3: GO PN TS UD; I4: BO FE FO MO PR PC RA RE; I5: AR FI GR LU MS PI PT SI; I6: AN AP AQ CH MC PS PE TE; I7: BA BR FG LE MT TA; I8: AV BN CB CE CZ CS IS NA PZ RC SA; I9: CL CT EN ME PA RA SR TP AG; IC: FR LT PG RI ROMA TR VT; ISO: CA NU SS OR.

A check log is required for 100 QSOs or more. Send log postmarked by 1 June to: ARI Contest Manager I2UJY, PO Box 14, 27043 BRONI (PV), Italy. An updated MS-DOS logging program for this contest is also available by sending US\$5 or 10 IRCS to the same address. You type the callsign and number received, and it calculates the points, multiplier, and score; prints the log, check log, and summary sheet; and prints QSL labels. It can be used real time or after the contest.

CW-M Contest

When: May 8/9 (?)

In past years, this interesting contest has stimulated considerable activity throughout what used to be the USSR. It is normally scheduled for the second weekend of May, however rules for the past 2 years have not been seen, and following the breakup of the USSR I am not sure if it still even runs. I suggest you listen for U- and R- stations giving contest numbers, and if any are heard, join in! The Baltic republics (YL, LY and ES), having left the old USSR, are probably no longer workable by VKs for credit in this contest. Logs used to go to Box 88 Moscow.

Ross Hull Contest 1992-1993

John Martin (VK3KWA) Ross Hull Contest Manager

Four further Ross Hull logs have been received. Thanks to the entrants for sending these in even though they were a little late! I will publish any further scores received up to the end of March.

Call	Name	6 m	2 m	70 cm	23 cm	3 cm	Total
VK3DEM	T Niem	14	176	57	60	16	233
VK5AKF	J Kang		210				210
VK5KAP	A Perkins	2	296	448	120		
VK5MQR	R Preston		528	161	160		849

VHF — UHF Field Day 1993

John Martin (VK3KWA)

VHF/UHF Field Day Contest Manager

Nothing went right with the Field Day this year. The rules should have been published in December rather than January, and deliveries of the January magazine were chaotic. Propagation crashed just before the Field Day, as did the weather in some areas — one hilltop station reported significant flooding of the tents! Nevertheless some notable contacts were made and much fun was had.

Most logs were extremely well presented, although some were hard work because they did not include an overall scoring table. As with the Ross Hull Contest, corrections have resulted in scores being increased.

Due to the late delivery of January "AR", I have extended the deadline for logs and will publish the scores of any logs I receive by the end of March. However I do not expect that any late logs will change the order of placgetters, so here are the results as they stand!

Results

The main prize this year has gone to Rob Ashlin, VK3DEM, for an excellent effort in his first VHF-UHF Field Day. The runner-up is Phil, VK5AKF. In the new six-hour section, first place goes to Doug Friend, VK4OE. In the multi-operator section, competition has increased but the Geelong Amateur Radio Club has regained the top place. The top scoring home station was Des Clarke, VK3CY. Congratulations to all.

Section	A	Name	6 m	2 m	70 cm	23 cm	Total
Section A — Single Operator, 24 Hours							
VK3DEM	R Ashlin		5220	3024	140	8384	
VK5AKF	P Habig	178	2928	2772	300	6174	
VK3AFW	R Cook		1044	504	30	1578	
VK4OE	D Friend	20	768	189	240	1217	
VK5BK	A Patch		288				288
VK5JRL	R Lamb		288				288
VK5NEB	E Zimmerman		288				288
VK4KZR	R Preston		220				220
VK5BWI	P Parker		152				152
Section B — Single Operator, 6 Hours							
VK4OE	D Friend	20	288	105	240	649	
VK5BK	A Patch		288				288
VK5JRL	R Lamb		288				288
VK4KZR	R Preston		160				160
VK5TZY	T Lowe	56	104	14			174
VK5BWI	P Parker		152				152
Section C — Multiple Operator							
VK5AT	(1)		410	5600	4543		10553
VK1DO	(2)		108	584	2520	330	8782
VK5BWI	(3)		400	3168	1134	220	4922

Section D - Home Station

VK3CY	D Clarke	2068	840	2908
VK5N	R Bowman	60	700	714
VK3UJL	G Sones	7	496	399
VK5LP	E Jamison	3	40	35
VK2NU	I Thomas	84	7	91

(1) Geelong Amateur Radio Club: M Trickett VK3ASQ, K Appling VK3DOW, B Abley VK3YXK, C Leone VK3BCL, L DeVries VK3PK, C Gazzanini VK3BZL, A Gazzanini VK3TU.
(2) C Davis VK1DK, G Rozenberg VK1CO, P Tams VK2CJ.
(3) A Raftery VK5BW, A Russell VK5ZUC, J Brayley VK5AQ, T Denton (SVL).

Next Year

The comments and suggestions made by entrants were studied carefully and are much appreciated. I have tried to keep the rules simple, but there have been some requests for changes and clarifications,

which I will do my best to put into effect next year. One definition requested is that of a portable station. I would suggest:

"A station is portable if the equipment, including antennas, has been transported and set up at a location other than the home station(s) of the operator(s)."

The rules could be simplified by dropping the ban on crossband contacts, and allowing operation from more than one locator square an entrant could then try two different locations on the two days. To dovetail better with the six-hour section, repeat contacts could be allowed after three hours rather than four. There is also support for a later finish on the Sunday.

There were some comments about the different scoring systems for the Ross Hull Contest and the Field Day. The rules could only be brought completely into line by using distance-based scoring

for the Field Day — no major problem — and not allowing repeat contacts (which would be a problem).

Using locators for the Field Day simplifies the scoring and provides an opportunity to collect squares for the Grid Square Award. On the other hand, most people have no trouble estimating distances from a map, but many do not know what their locator is and do not care how many locators they work. I will give more thought to this and would appreciate any further comments.

There is still strong support for running the Field Day at the end of the Ross Hull Contest, so next year's dates should be the same as this year's.

* Federal Contest Coordinator

24 Sovereign Way, Avondale Heights, 3034

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WIA FEDERAL 1992 ANNUAL REPORTS

FEDERAL PRESIDENT OVERVIEW

The year just completed has been both busy and financially successful for the WIA. Major events and activities included WARC92, sole provision of the amateur radio examination service and considerable progress towards finalising new regulations with DOTC. During the year a changed management structure was implemented with the introduction of a WIA board of Directors and work has started on revising the Articles of Association.

FEDERAL MATTERS

Federal office

To a large extent the year in the Federal Office has been one of consolidation. As you will see from the financial statements the General Manager and the Office staff are to be congratulated on their prudent management of our funds with a performance which exceeded budget planning.

The WIA Examination Service has now completed a full year and better information is available on its profitability. During the year statistics on examination events and papers per event allowed a review of pricing; which was based upon a greater number of candidates attending a lesser number of examinations. It appears the scheme is now "too convenient", leading to greater overhead costs per examination event. As a consequence and in order to recover over a reasonable period of time, members' subscription funds used to finance the scheme, examination event prices were increased from October. Some concerns were expressed over these increases however indications from candidates suggest they are not unduly concerned with the changes. We gain the impression a number of candidates are still regularly "having a go" rather than preparing themselves properly to gain a pass.

During the past year the General Manager's work load has remained high and he has provided a considerable voluntary contribution to the work of the Federal Office. This workload must be addressed by the new Board with some urgency.

Membership Statistics

Information supplied by DOTC on licences issued by them show a 2% decrease to an end of year total of 18166. Unfortunately our membership figures have shown a much greater trend with a loss of 6.7% to an end of year figure of 6334. Examining the detailed statistics further shows full call members are proportionately higher than the licence figures, novices and limited calls considerably lower and combined calls roughly on line. Other concerns are the loss of members through non renewal after one, two or three years membership. Finally the year past was severe on older members with an apparently

larger number of silent keys. With an ageing population trend nationwide, we need to devote considerable attention to recruiting new members.

Federal Executive

As required by the existing Articles of Association, a Federal Executive was elected at last year's Federal Convention. Only the seven Federal Councillors were appointed to that Executive. Council also resolved to re-arrange the management structure of the WIA so that Executive, which is formally named in the Articles, would only meet for ASC prescribed actions. In June the Executive met and effectively passed its management responsibilities to the WIA Board of Directors, who are the seven Federal Councillors acting with full company director's powers and responsibilities. The Board, to discharge its fiduciary duties to the ASC, also monitors the operations of the WIA to ensure policies are applied, objectives met and financial viability maintained.

WIA Board of Directors

The Board of Directors, with its representatives from each Division, has met each quarter since June. The Board has discharged its management responsibilities whilst remaining responsive to the Divisions through the views of the Federal Councillors. Obviously this is an interim arrangement until the Articles are re-written to reflect the new structure.

Articles of Association

To formalise the management structure used during 1992 the [Council] adopted a series of Regulations under Article 103. These Regulations have provided guidance in the revision of the Articles of Association, last formally rewritten in 1974. Changes in company law, brought about by ASC requirements have also been included. It is our intention not to rush this revision, never-the-less we plan to have them adopted well before the end of 1993.

Corporate Planning

As reported last year most of the activities identified in the Corporate Plan have been achieved, or relate to issues outside the responsibility of the Federal body. The next step has been to develop clear, yet broad Policy Statements and Annual Objective Statements.

Several years ago the Federal Council adopted a series of Policy Statements on a wide ranging series of topics. In the year just past the Board has revisited those Statements and produced several new ones. There are now some 13 up to date Policy Statements which provide guidance to Divisions, Federal councillors, Board members, the General Manager and WIA officers on WIA agreed policy. These are

progressively being published in the columns of AR magazine to inform amateurs of their contents. Naturally Policy Statements are dynamic expressions and can be revised at any time.

Objectives are set in advance to aid the budget formulation; they indicate known likely areas of activity during the coming year. These are also published in AR magazine for members information.

Amateur Radio magazine

Amateur Radio magazine has, in my personal opinion, acquired a disproportionate amount of the Board's time during the past year. I feel that situation is now over with a definitive Policy Statement on AR magazine nearing adoption.

The Board has agreed the magazine is the WIA's house journal, it needs to cater for the wide ranging interest groups within our hobby, as well as convey information to members and serve as a journal of record for posterity. In all not an easy task to pull all this together with principally volunteer contributors, part time editorial staff and budgetary constraints.

It is proposed to concentrate effort on further enhancing the presentation or appearance of the magazine and continue production in an economic manner. A wide range of production options will be examined in 1993 to see what they have to offer for our type of journal and size of production run.

INTERNATIONAL MATTERS

WARC92 involvement

It was seen timely to report the WIA's involvement in WARC92 in considerable detail at last year's Federal Convention and in the columns of AR magazine.

Ongoing Commitments

The WIA continues to be involved in ITU and IARU related matters. Periodic meetings are attended at which the Australian position on changes to the ITU is examined and developed. Indications suggest no specific amateur representation will be required at WRCs (the successors to WARC92) for a few years, although the IARU could very well be involved.

Next year IARU Region III meets in Singapore. The WIA will shortly be starting its preparations for that meeting, including considering whether to nominate for the position of Region III Secretary.

DOTC MATTERS

New Regulations

Arising from initiatives by DOTC at last year's Federal Convention, the WIA compiled a series of recommended changes to the amateur regulations expressed principally in RIB71. The opportunity was taken to obtain inputs from packet users, repeater

users and FTAC before negotiations were commenced with DOTC. What appeared to be an essentially completed exercise, following with the Minister's speech read at SEANET'92, has now become a long and drawn out affair with no set completion date in sight due to the new Radcom Act 1992, setting up of a Spectrum Management Agency by DOTC and the April 93 elections.

SMA

The Radcom Act 1992 sets up a Spectrum Management Agency to carry out the duties currently done by DOTC's Radiocommunications Division. Amateur radio remains managed by regulation and some early WIA approaches to determine whether its administration will be offered for tender have met with the reply that it is too soon to provide an answer. Nevertheless this is a possibility the WIA should remain aware of.

Incomplete Actions

The hiatus created by the Radcom Act, the SMA and other changes in DOTC has contributed to a substantial backlog of WIA actions with the Department. Many of these are related to reciprocal licensing agreements and third party traffic arrangements with other nations, which by their nature are usually long and drawn out processes.

STANDARDS

WIA involvement in standards has expanded to three fronts, namely Standards Australia, AUSTEL and DOTC. The last two are emerging activities, with the first being an ongoing commitment.

AUSTEL, in its setting of telephone and associated equipment standards, is of emerging importance, not only for connection to the public network through phone patch terminals, but also through immunity standards for domestic telephones. An overseas radio magazine recently described the modern phone as an RF transparent plastic cased collection of diodes and multi band antennas!

The Radcom Act 1992 empowers DOTC with setting equipment standards for radio frequency apparatus. Obviously it is in the amateurs' best interests to avoid type approval or sealed equipment. The WIA's position is amateur equipment should meet reasonable performance and safety characteristics, for amateurs' personal safety and security from interference complaints.

THANKS

I wish to record my personal thanks and also the thanks of the WIA to the following: Our General Manager/Secretary, Bill Roper VK3ARZ and his loyal hard working office staff.

My fellow Board members, Rob Apathy VK1KRA, who also doubled as Vice President, Roger Harrison VK2ZTB, Peter Macellan VK3BWD, Murray Kelly VK4AOK, Bill Wardrop VK5AWM, Neil Penfold VK6NE and Jim Forsyth VK7FJ.

Our Federal Coordinators and Officers, whose efforts are truly appreciated:

	Graham Ratcliff	VK5AGR
Awards	John Kelleher	VK1GDP
Contest Manager	Peter Nesbit	VK5APN
Education	Brenda Edmonds	VK3KT
EMC	Hans Ruckert	VK2AUO
FTAC	John Martin	VK3KWA
Historian	John Edmonds	VK3AFU
Honorary Legal Counsel	George Brzostowski	VK1GB
IARU	Kevin Ollis	VK1OK
Int'l Travel Host Exch	Ash Nallawalla	VK3CIT
Intruder Watch	Gordon Lovelady	VK4KAL
Media	Roger Harrison	VK2ZTB
OSL Manager(VK0.9)	Neil Penfold	VK6NE
Standards	Roger Harrison	VK2ZTB
Videotapes	John Ingham	VK5KG
WARC & CCR	David Wardrop	VK3ADM
WICEN	Leigh Baker	VK3TP
Ron Henderson	VK1RH	Federal President

IRU REGION III

This report covers largely the period from the 1992 Federal Convention to the end of the year as I did not take up office until the 1992 Federal Convention. 1991 had been the year of the IRU Region III meeting in Bandung, Indonesia, and my predecessor in this job, Ron Henderson VK1RH, had completed all outstanding matters from that meeting prior to my taking office. This has meant that the year since the 1992 Convention has been rather a quiet one.

On the Region III front, few new matters have arisen. Major matters continuing from the Region III meeting have been the Promotion of Amateur Radio Committee established at the Region III meeting and the establishment of a Region III Amateur Radio Direction Finding Competition. The first running of this competition is due in 1993. Through its representatives, the WIA is involved in both these groups.

Although 1992 has been a quiet year, 1993 can be expected to become busier as we begin to gear up for the 1994 IRU Region III meeting.

On the international front, 1992 saw the holding of WARC 92 in Spain. The WIA was ably represented by David Wardrop VK3ADM and Ron Henderson VK1RH as part of the Australian delegation. Many thanks to both for their efforts. As was reported from that WARC, future WARC's will be held more often to consider a narrower agenda. It is thus vital that the amateur fraternity maintain its representation on the international front.

Recommendation

Given the increasing demands being placed on the WIA which require international representation, the International Representation Levy component of WIA subscriptions should be maintained.

Kevin Olds VK1OK
IARU Liaison Officer

FINANCIAL

As a non-profit organisation, the WIA should always budget for an excess of income over expenditure of about 5% of income. Expenditure for fixed assets (equipment, etc.) can only be made from Accumulated Reserves.

The 1992 budget for the Federal WIA was constructed for a surplus of income over expenditure of \$19,550 or 4.5% of budgeted income.

Income for the year was \$10,134 more than expected, and expenses were tightly controlled resulting in savings of \$13,460 better than expected. The resulting surplus of income over expenditure of \$43,144, or 9.7% of gross income, boosted Accumulated Reserves to a healthy \$119,408.

The International Representation provision balance, included in the Accumulated Reserves, stands at \$19,013.

Bill Roper, VK3ARZ

General Manager & Secretary

PROFIT AND LOSS BUDGET AND ACTUAL AMOUNTS FOR 1992

INCOME	BUDGET ACTUAL VARIATION			1991
	Amount	% ACTUAL		
ADVERTISING (incl. HAMADS) - AR	40000	47181	7181 18.3	45981
CALL BOOK	32000	33698	-502 -2.5%	32412
DONATIONS	0	18	18.0	0
EXAMINATIONS INCOME	24000	40712	16712 88.8	5619
INSERTS - AR	500	442	-58 -26.3	503
INTEREST RECEIVED	1400	1243	-167 -11.8	1273
INTERNATIONAL DONATIONS/LEVIES	12500	12708	126 1.0	19060
MAGPUBS	2900	3151	251 8.6	2943
MEMBER SUBSCRIPTIONS	255000	262995	-705 -0.3	303477
SUBSCRIPTIONS (SSEAS DIRECT) - AR	5500	5322	-18 -3.2	5473
SUNDY INCOME	2500	1414	-1088 -43.5	2859
TEAC FEE INCOME	4000	3674	-326 -8.2	4575
TOTAL - INCOME	43780	44914	1034 2.3	44233
LESS EXPENDITURE				
AWARD	2000	0	2000 100.0	2012
AUDIT FEE	3000	3000	0 0.0	3308
AWARDS - AR	500	312	188 37.5	594
AWARDS & SPECIAL PROJECTS	750	1602	-852 -11.3	1553
BAD DEBS WRITTEN OFF	500	500	100 100.0	0
BANK CHARGES	250	2351	149 5.9	2394
BULK POSTS - AR	40000	38675	1425 3.6	38955

CALL BOOK EXPENSES COMMITTEE/COORDINATOR

EXPENSES	1300	1741	-541 -41.5	2644
CONVENTION EXPENSES	23000	18276	3724 16.9	18322
DOTC LIAISON	1000	586	521 51.5	1227
DEPRECIATION	7900	8384	-464 -5.1	8907
DRAFTING - AR	1000	623	388 38.0	495
ELECTRICITY	1700	1483	231 13.6	1619
EXAMINATION EXPENSES	4800	5332	-532 -10.6	5388
GENERAL EXPENSES/INDURIES	1000	2092	-1092 -10.9	2019
IARU QUES	5000	4849	151 3.0	4488
INSURANCE/WORKERS COMPENSATION	5500	5677	-177 -3.2	5253
INTERNATIONAL REPRESENTATIVES				
PROVISION	12580	12798	-126 -1.0	15060
LONG SERVICE LEAVE PROVISION	0	1960	-1960 0.0	0
MAGPUBS EXPENSES	3900	4456	-556 -14.2	3943
POSTAGES & FREIGHT	10000	9938	122 0.6	9971
PRINTING - AR	57000	57070	-70 -0.1	55214
PRINTING/STATIONERY/OFFICE SUPPLIES	10000	6482	3518 35.2	10413
PROMOTION/ADVERTISING/RECRUITING	4800	2411	-2159 45.5	5382
RENT & CLEANING	11000	19300	-8300 -2.8	16644
REPAIRS & MAINTENANCE (OFFICE)	1500	1749	-249 -16.6	1490
SALARIES & SECRETARIAL	145000	147057	-2057 -1.4	148917
TEC EXPENSES	2000	880	1129 56.0	2303
TELEPHONE	3500	4022	-522 -14.9	3816
TRAVEL - AR	0	0	0 0.0	0
TRAVEL (BOARD)	2000	75	1922 96.1	674
TRAVEL (FEE)	500	416	84 16.9	595
TYPESETTERS - AR	25000	22100	2900 11.6	25354
WRAPPING & ADDRESSING - AR	15000	9556	1544 13.4	18660
TOTAL - EXPENSES	41426	40770	1349 3.2	417114
SURPLUS/DEFICIT	1950	3044	2594 12.7	25229

PUBLICATIONS COMMITTEE

This report has been compiled mainly from the material on record in the minutes of the Publications Committee for the 12 monthly meetings of 1992. The year seemed to split naturally into two halves, the predominant feature of the first half being the number (usually a dozen or more) of typographic and layout errors in each issue. There was a great improvement from August on. One issue had as little as three errors! This was brought about almost solely by the supply of material to the typesetters on floppy disks. Any errors detected at a proof-reading (of which there were usually three) could thus be eliminated.

This use of disk transfer was made possible by a change of typesetters. Unfortunately the previous typesetters (Magazine Graphics) were not equipped for disk input, but our printers (Industrial Printing) could also handle typesetting from disk and have been performing both functions since July. Three benefits have accrued from the change. Firstly, we have a much closer control over every word of input. Secondly, there are many less typographical errors since they cannot be introduced after proofing. Thirdly, because the process is more automated it actually costs less, and even in six months has saved some thousands of dollars.

There were several administrative changes during the year. Most significant was the decision of the 1992 Federal Convention to disband Executive and place most of its functions under the direct control of the Federal Secretary, who thus became the Publisher (among many other things!). The Editor also lost the "Executive" prefix. The Managing Editor (Graham Thornton, VK3VY) resigned for personal reasons as from the end of June, and was replaced by Bruce Bathols VK3UW under the title "Production Editor". I would like here to place on record my sincere thanks to Graham for his three years of service to "Amateur Radio" magazine, during which he so effectively directed production at a time when no other appropriately skilled person was available. He has not severed all ties with AR, but is still one of the proof-reading team, which also includes Allan Dobie VK3AMD, Jim Payne VK3AZT, and John Tutton VK3ZC. The eight members of the Publications Committee itself are still the same as listed for 1991 (see April 1992, page 23).

The financial results for the year were very close to budget. Income was \$53,000 (\$7,000 over budget), expenditure \$225,000 (\$15,000 under), membership contribution \$174,000, and cost per copy mailed to each member \$2.42 (vs budgeted \$2.56). As for 1991, Bill Roper must be congratulated on the accuracy of his budget.

Once again I would like to thank all concerned with the publication of AR for their co-operation. To the members for their contributions (particularly the regular columnists), the Committee and the Technical Editors, the proof-readers, the typesetters/printers, the Publisher and the Federal Office staff, the mailing house and any other helpers still unlisted, my deepest gratitude! May we do even better in 1993!

Bill Rice VK3ABP
Editor

FEDERAL TECHNICAL ADVISORY COMMITTEE (FTAC)

The past year has been fairly quiet — hence this brief report — but worthwhile progress has been made, especially in the area of consultation regarding our new licence conditions.

Membership and Activities

The following members of the liaison panel resigned during the past year: David Lyddith, VK1AR; Bob Alain, VK5BJA; and Glenn Thurston, VK5ZGT. The new members of the liaison panel are Ian Cowan, VK1BG;

Garry Herden, VK5ZK; and Joe Nevin, VK6ZTN. Thanks to those retiring members for their help, and thanks also to the new members for taking on the job.

The major activities for the past year have been:

1. Maintenance and updating of the beacon and repeater Data Base;
2. Consultation and drafting of recommendations for deregulation of licence conditions (especially relating to repeater linking and packet radio identification);
3. Consultation on frequencies for beacons, links and repeaters;
4. Processing of record claims.

Problems and Concerns

1. Responses from some Divisions, and communication from the federal Board to FTAC, have been disappointing.
2. The inoperative condition of many beacons is still a matter of concern, as it was a year ago.
3. Increasing pressure for the use of MDS frequencies for pay TV poses a potentially serious threat to the 2.3 GHz amateur band.
4. Some revisions to the band plans are needed, largely as a result of new privileges for Novice and Combined licensees, and also to make provision for new techniques such as digital store and forward, linear translators etc. It is proposed to circulate a set of recommendations to all Divisions during the next few weeks.

Conclusions and Recommendations

1. Members of the FTAC panel should be commended for their assistance in the consultative process leading up to the adoption of our new licence conditions.
2. It is recommended that the Board take urgent action in an attempt to prevent the possible loss of spectrum in the 2.3 — 2.4 GHz range with the introduction of microwave pay TV.
3. Divisions are again urged to review the operating condition and frequency allocation of beacons.

John Martin VK3KWA
Chairman, FTAC

STANDARDS

While there was little activity in relation to Standards during 1992, there was one event of significance to amateur radio during the year. This was the introduction of standards covering a wide range of electronic and electrical appliances and equipment which can either cause, or suffer from, RF interference.

Standards Australia issued new joint Australian and New Zealand standards in October covering EMI and EMC relating to appliances. A complete set of these has been purchased by the Federal Office and are held in the library there.

RF immunity levels for TV and broadcast receivers is covered by one of these new standards, while others cover the unwanted RF energy (RFI) generated by VCRs, TV and sound broadcast receivers, computers and other information technology equipment, vehicle ignition systems and power tools.

The standards of particular interest are:
AS/NZS 1053, on interference caused by TV and sound broadcast receivers;
AS/NZS 2557, on interference from various types of engines;
AS/NZS 3548, on RF interference from IT (computer) equipment;
AS/NZS 4053, on RF immunity of TV and sound broadcast receivers.

The issuing of these new standards is an important preliminary to revisions currently under way to the Radiocommunications Act 1983. When originally drafted, provision for such electromagnetic compatibility (EMC) standards was included in the Act, but Australian governments to date have been reluctant to make mandatory standards, perhaps under pressure from manufacturers and importers.

The move to issuing regional standards was foreshadowed, in part, in my report for 1991.

It now seems such EMC standards will become a technological imperative for consumer goods in Australia, long after wide adoption in Europe.

Roger Harrison VK2TBB
Standards Co-ordinator

WICEN

When I took on the task of being National Co-ordinator for WICEN I agreed to do it for a limited period of three years. That period of time has now come to an end. I chose this period of time because I felt that it needed at least that long to get over the inertia of the past and to start the Divisions to start seeing all of the Divisional WICEN issues as part of a larger National scene. My concerns in this regard were correct and while many things have certainly been accomplished by the Divisions over the last three years, I feel that many of them still see themselves as small and isolated fishes in a large and muddy pool. I have not changed my belief that this does not need to be the case.

Many of the Divisions are still struggling through the mire of self determination, desperate for more members to become involved with exercises. This is so that they can raise enough money to administer themselves or to get the essential capital equipment to provide the basis for an effective state-wide network. All of this is necessary but I personally believe that few WICEN administrators take the time to plan enough in advance to foresee where they want their Division to go.

There needs to be a really strong centralised base of amateurs willing to do community events, so that WICEN can develop an effective administrative and capital equipment base, or alternatively funding is going to be required from other sources. WICEN also needs to develop a strong sense of teamwork and belonging for its members.

WICEN MUST also cater for the needs of the amateur living in an isolated community who, simply because he lives in a place where a disaster may happen and emergency communications be required, needs to be able to quickly and easily

integrate into the formal emergency network. WICEN, put simply, should be the co-ordinating factor or catalyst for the average amateur to access response and recovery agencies in emergencies.

If you look deep into the past amateur responses in the really large disasters, WICEN has simply had some "first in teams" and then assumed the co-ordinating role for other volunteers from the general amateur movement. There is NO WICEN Division which will have enough members or resources available to cope with a major disaster without help from the rest of the amateur fraternity. To this end I believe that when such a response is required, WICEN will be flooded with offers of assistance. WICEN must ensure that it has the administration necessary to cope with the tasks placed upon it and to look after the people working for it at these times.

United into an effective National organisation WICEN will be well received by both State and Federal agencies. Many of the disaster agencies in the smaller Divisions are well aware of the potential resource available to the community through WICEN and are patiently awaiting for WICEN in those Divisions to become more organised. We are well received by many such agencies now!

As part of the National structure we must standardise operations, procedures and administration as much as possible given the diverse organisational structure of WICEN in the Divisions and the differing structures in the various disaster plans. There are three Divisions that are incorporated and two of these also have charity status. Other Divisions are still looking at incorporation. In some Divisions the lines of communication between WICEN and the WIA need to be vastly improved. All of these issues and the fact that we are all volunteers with limited time and money make it difficult to standardise in all things, but we must do so as far as we are able as quickly as possible.

It has been a year of internal turmoil for several Divisions as they have gone through periods of review and restructure. The results of these should now start to show up in improved communications and internal administration in the next few months. Thanks to David VK3UR in his backstop role to me and also, with Paul VK3PW, for the distribution of both public and administrative WICEN information around Australia via WICENs ever expanding Information Network (I must confess that I cannot understand why the WIA Divisions and Federal Board do not use a similar network).

I would like to thank Trevor Connell VK8CO for his efforts to get a standardised WICEN Training Manual off the ground, and to Brian Merris VK4KS for his various packet rally scoring systems. I would also like to thank the Divisional WICEN Co-ordinators for putting up with my reams of mail and general "interference" in the running of their Divisions. I trust that they saw my comments as constructive and intended to co-ordinate rather than just plain old interfering.

Thanks to all WICEN Members for your efforts and support.

Leigh Baker VK3TP
National WICEN Co-ordinator

CONTESTS

The past year has seen the retirement of Neil Penfold VK6NE as Federal Contest Coordinator, and Frank Beech VK7BC as VK7L/Oceania DX Contest Manager. Both gentlemen have contributed significantly to WIA contest administration over the years, and on behalf of WIA members I would like to thank them sincerely for their services. Action is now in hand to find a new manager for the VK7L/Oceania DX Contest, which will take place as usual later this year.

The WIA contest managers are now:
John Martin VK3KWA: Ross Hull & VHFIUHF Field Day
Phil Raynor VK1PJ: John Moyle Field Day Northern Corridor
Radio Group VK6GNC: RD Contest
Ray Milliken VK2SRM: VK Novice (vacant)
VK7L/Oceania DX

Help protect our frequencies — become an intruder watcher today.

The coverage of contests in AR has been significantly expanded, and many letters received from members approving the new format. This expanded coverage will continue, and will include the results of overseas contests in which VKs have participated, where available.

To minimise the amount of space required in AR, overseas contest rules are now being abbreviated for publication, and will be supplemented by a set of "General Rules and Definitions" published approximately yearly. This exercise has revealed considerable scope for standardising many rules and definitions, and I intend to raise this issue with contest organisers both here and in the USA and UK. Standardisation promises worthwhile benefits for entrants, including better publicity (due to less space required to print the rules), the elimination of "grey areas" in the rules, common requirements for logs and check logs, and eventually, the ability to use a single computer logging program for all contests.

Discussions are currently being had with the WIA contest managers regarding computer logging programs, and a standard format for computer generated logs will be published in AR in due course. Unless there are good reasons to do otherwise, the format is likely to correspond to that currently emerging from the USA.

In closing, I would like to thank the WIA contest managers for their valued services, and WIA staff for their help.

Peter Nesbit, VK3APN
Federal Contest Coordinator

AWARDS

Achievements

- With the assistance of the staff of the Federal Office, I have been able to reduce the TOTAL DXCC active files from seven to four active folios. This was done by personally transcribing ALL DXCC files on to new "Country Lists", and placing ALL Active files on to a computer database. This simplified the overall action down to mere additions and subtractions.
- Two DXCC standings lists have been published in AR, the latest being the most precise. I have promised publication of DXCC standings on a roughly six monthly basis. The DXCC Roll of Honour has been introduced. The low limit being nine countries below the total DXCC countries. When the Roll of Honour was introduced, the total DXCC countries were 323. With the addition of the Yugoslavia Republics, it is now 326, with further changes in the offering.
- DXCC profiles of the leading amateurs, who have earned total DXCC countries has also been introduced. Comments received have been glowing.
- The certificates for the Antarctic and Grid Square awards were also designed and printed. Several of each have been awarded.

Problems

There have been very few problems since the conversion of files, and whatever other troubles occurred, have been easily and efficiently handled by the Federal Office staff.

Conclusion and Recommendation

1992 can only be described as a successful year, through interest in Award activity, and the overall co-operation that I have experienced. With poor propagation conditions prevailing, I have been surprised by the activity in the Awards section. If I have made the applicants happy, then I am gratified, and I hope that this situation continues.

To engender more amateur activity in Australia, it is my intention to investigate the introduction of another award. I will be discussing this idea with my colleagues as to its viability. I refer to the VK Cities Award (VKCA). I invite comment in this regard.

John Kelleher VK3DP
Federal Awards Manager

VK9/O QSL BUREAU

As many would have read in various magazines, QSL activities by the various organisations and operators have lately come under scrutiny.

Letters to the Editor, DX columns etc mostly contain complaints, explanations and long lists of QSL Managers. One publication now lists 45,600 world wide. Added to all this is the recently noted reluctance of DXpeditions to use the bureau system. This has caused a list of VK9/O operators to be initiated, and printed in various publications, who do not use the bureau. Before any call sign is published, an effort has been made to contact the operator. Some telephone calling found two VK9/Os and the rest of the VK9/Os were sent packets of cards with a request to contact the Bureau Manager and tell him what was to be done with the cards remaining in the bureau.

The returns have been most disappointing. Most have ignored the request, while one asked for his cards (approx 3 kg) to be sent to Germany post free.

Recent DXpeditions to Cocos and Christmas Islands have been approached on their arrival in Perth. They have co-operated, as well as the two from VK6.

One over-riding factor with DXpeditions now is that the operators want help in defraying the costs of the expedition, and look to the QSL activity to achieve some recompence. If a card is required, you are expected to pay for it. Bureau operations are becoming obsolete.

One case is worth mentioning as the worst case (depending on your point of view) as to the cost of a QSL card. To receive a card from F6BNU costs \$2 US, which coupled to the cost of outgoing postage makes the card to a VK operator \$4.

One of the problems facing all Bureaux is the disposal of unwanted cards. Some organisations return unclaimed cards, others destroy them. Postage costs coupled with a fee per card charged by some bureaux makes the return of cards from the VK9/O Bureau an uneconomic exercise. Most operators of VK9/O call signs are not members of the WIA.

At the end of 1992 the VK9/O Bureau was completely cleared of all QSL cards.

Neil Penfold VK6NE
VK9/O QSL Bureau Manager

EDUCATION

The year 1992 was noteworthy as the year in which the WIA assumed full responsibility for the amateur examinations throughout Australia. As Education Co-ordinator I have watched the development and progress of this system very closely, and am pleased that at last the scheme which the WIA proposed in 1987 as preferable, if examination devolution was inevitable, has become a reality. As a direct result of the foresight, planning and hard work invested in 1991, mainly by the General Manager, the examinations are running very smoothly with a surprisingly low complaint level.

The next step is the review and extension of the examination question banks, which began during 1992, and which I hope will be completed by the end of 1993. A small number of volunteers have been assisting with review of existing and proposed questions, including a few which have been identified on examination papers as poorly worded or open to alternative interpretation. The ultimate aim is to ensure that the theory banks are balanced, of appropriate standard, and of adequate size. At that point, I feel that the WIA should publish the question banks.

The question banks for the Regulations examinations are still a problem. It has been very disappointing that after all the work that was put into the revision of the DoTC regulations (RIB 71), the final version is unlikely to be released until July 1993. This has meant that the revision of the Regulations question bank cannot be completed. It has also meant that a number of potential amateurs, who have been given to understand that a code-free Novice

licence is to become available, have grown tired of waiting. However, it has also, apparently, stimulated a number of Limited licensees to upgrade to the proposed intermediate stage by passing 5 wpm Morse code, and so become eligible for added privileges when the new regulations are in force.

My activities as Education Co-ordinator have been reduced in 1992. I have had less direct contact with clubs and individuals, and have not managed to attend as many Conventions or Hamfests as in other years. In addition, I have reduced the Education Notes in Amateur Radio magazine to every second month rather than monthly, because of the pressure on the magazine for space.

I give notice to the Board that this is my 12th Annual Report, and that I feel it is time for some other volunteer to be groomed for this position. I would like to continue until the question banks are finalised and published, but I think by then it will be time to hand over.

I would like to thank a number of individuals who have helped me this year. It is not necessary to name them. I expect 1993 to be a very busy year, and am confident that those helpers will respond to requests for assistance once again.

Brenda M Edmonds VK3KT
WIA Federal Education Co-ordinator

AMSAT-AUSTRALIA

The number of Amateur Satellite operators has once again steadily increased during 1992, particularly in the area of the 9600 baud Packet Radio satellites (PACSATs), and to a lesser extent the 1200 baud PACSATs. There also has been a steady trickle of newcomers to Amateur Satellites who are more interested in using Amateur Satellites for CW or voice communications, and have found great satisfaction in using the Russian Low Earth Orbit Satellites like RS-10/11 and RS-12/13, and the highly elliptical orbit AMSAT-OSCAR-10 and AMSAT-OSCAR-13.

Since Maggie Laquinto VK3CFI first made contact with Musa U2MIR, aboard the Soviet Space Station MIR in 1991, Maggie has continued to keep contact with each new crew aboard MIR, which has meant that many Australian Amateurs have subsequently had the opportunity to communicate with the Russian Cosmonauts, both on voice and Packet Radio.

AMSAT-OSCAR-21 (RS14) was launched on the 29th January 1991 and has been plagued with problems during 1991. However during 1992 the RUDAK Command Team have been very successful in activating the Digital Signal Processing Experiment, enabling an FM repeater in space with an input on 70cm and an output on 2m. This mode has generated an amazing amount of interest, and like MIR activities, has allowed Amateur Radio operators with FM only equipment to gain experience in using Amateur Radio satellites, without the need to purchase any extra equipment.

In 1992, Australian schools were once again given the opportunity to talk to the astronauts aboard the Space Shuttles carrying Amateur radio operators. Unlike the first experiments in 1991, where a number of Amateur Satellite operators provided the radio link, in 1992 a number of Amateur Satellite operators set up equipment at the schools to enable "live" contacts. During one contact, normal communications were lost between a NASA Ground Control Station and the Shuttle, and a backup link was provided by Andrew Keir VK4KIV, who was providing the equipment for a link for students and staff at the Queensland University of Technology, NASA and the Shuttle Amateur Radio Experiment (SAREX) coordinators, continue to schedule Australian school children contacts on all future Shuttle flights which have SAREX on board. Any school wishing to arrange a schedule contact on any future message can obtain a SAREX application form by sending an SASE to AMSAT-Australia, GPO Box 2141, Adelaide SA. As well as these activities all amateurs had the opportunity to work SAREX on board the Shuttle either on voice or Packet Radio.

In 1992, no Australian representative attended the Third Phase IIRD Experimenters' meeting in Marburg, Germany, as the two projects originally proposed in 1991 failed to materialise. I do not plan to attend the 1993 meeting, but plan to attend the 1994 or 1995 meeting to be trained as a Command Station for this new generation of Amateur Radio Satellite, due for launch in mid-1996.

UoSAT-5 (OSCAR22) which was launched on the 17th July 1991, was intended to have only a limited-access (download only) Amateur Packet Radio store-and-forward package using 9600 baud AFSK. However, when the commercial HealthSat facilities on UO22 failed, it was decided to cease the shared Amateur Radio activities on UO-14 with VITA. UO22 was then commissioned for exclusive Amateur Radio operations, and HealthSat operations moved to UO-14. This turned out to be of considerable benefit to the Amateur Radio community as UO-22 had many more resources than did UO-14.

The success of UoSAT-OSCAR-22 and the MICROSATS-PACSAT-OSCAR16 (AMSAT-NA) and LUSAT-OSCAR-19 (AMSAT-Argentina) with their general-access Amateur Packet Radio store-and-forward packages continues to be responsible for the continued upsurge in Amateur Satellites activity. As mentioned in last year's report, these Packet Radio Satellites have seen the reduction in the amount of HF forwarding of Packet Radio messages due to the efforts of a number of Satellite Gateway stations, mainly Garry Herden VK5ZK, and Brian Beamish VK4BBS, being the two main providers of this service. The activity of the Satellite Gateways has seen some congestion in the activities of individual users of UO-22 and KITSAT-OSCAR-23(KO-23 another UoSAT built 9600 baud Packet Radio Satellite, built for and operated by Korea), but this is being self-regulated by users and the software developers. This has generated some very interesting statistics which I can supply if the Board thinks they may be of interest to WIA members.

Thanks must go to Bill Magnussen VK3JUT who has continued to provide the material for the AMSAT-Australia column in "Amateur Radio" during 1992. This column has generated almost half of the 1000 plus mail items that I have received during 1992.

During 1992, AMSAT-OSCAR-13's apogee has been steadily progressing towards the equator providing much more access to the Southern Hemisphere stations. During 1993, AMSAT-OSCAR-13 will provide the widest international coverage of any Amateur Satellite with the exception of AMSAT-OSCAR-10 which still provides excellent communication even though the onboard computer failed in 1986. This should see an increase in the use of Amateur Satellites for world-wide voice communications.

To give the Federal Councillors some appreciation of the interest in the Amateur Satellite Service during 1992, AMSAT-Australia received just over 1200 items of correspondence (an increase of 20% on last year), requesting information on hardware, literature and of course tracking and software to use the PACSAT store-and-forward satellites. The AMSAT-Australia monthly NEWSLETTER has increased its total number of subscribers since it started production in April of 1985 from 700, to just over 700 in 1992.

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia, and ask that the 1993 Federal Convention recommend that the WIA continue to support AMSAT-Australia financially at the present level.

Graham Ratcliffe
AMSAT-Australia National Coordinator

Have you advised
the DoTC of your
new address

FEDERAL TAPES

1992 was the 17th year of the practice of Federal News being provided on a recorded tape cassette for playing on Divisional weekly news broadcasts.

During those 17 years both Ron Fisher and I put in a lot of work (Ron concentrating on the technical production of the tapes, and me concentrating on the news scripts), and we had a lot of fun. We both like to think that we provided a much needed and appreciated service for the WIA.

However, at a meeting of the WIA Federal Board of Directors on 24th October 1992, the Board decided to discontinue the Federal Tapes and provide future WIANEWS to the Divisions in the form of news releases.

Ron and I would like to take this opportunity to thank those volunteer Divisional broadcast announcers and engineers who so ably assisted us in presenting the Federal Tapes over the 17 year period.

Bill Roper VK3ARZ

GENERAL MANAGER and SECRETARY

The Federal Office, apart from providing administrative and secretarial facilities for the Federal Council and the Federal Board of Directors, exists mainly as a secretariat for the WIA state Divisions to provide those member services, such as Amateur Radio magazine, Call Book, Customs certification, DoTC Liaison, examinations, membership database and fee processing, etc., which can be carried out more efficiently on behalf of the Divisions by a centralised office.

1992 was another year of continued development and further computerisation of administrative procedures so that the Federal Office could run more efficiently and effectively.

Amongst the more significant happenings during the year were the following:

Intensive and lengthy negotiations with the DoTC regarding the new licence conditions; Production of the 1993 Australian Radio Amateur Call Book; An enforced change in the method of production of Amateur Radio magazine; Introduction of a more modern and efficient membership renewal form; WIANEWS production moved offsite and the end of Federal Tapes; and Trial of an alternative method of delivering Amateur Radio magazine to members.

Office staffing remained unchanged. The staff currently consists of:-

Full time paid employee			
General Manager	Bill Roper	VK3ARZ	60 hours pw
Part time paid employees			
Office Manager	Brenda Edmonds	VK3KT	285 hrs pw
Book keeper	Jane Fox		25 hrs pw
Membership & Exams	Chris Russell	VK3LCR	30 hrs pw
Membership	Margaret Allen		18 hrs pw
Contractors			
Editor	Bill Rice	VG3ABP	6 hrs pw
Production Editor	Bruce Bahns	VK3UV	14 hrs pw
Membership computer maintenance	Earl Russell	VK3BER	1 hr pw
Volunteer workers			
Librarian	Ron Fisher	VK3OM	3 hrs pw
	Bill Roper	VK3ARZ	
	General Manager & Secretary		

ELECTRO MAGNETIC COMPATIBILITY (EMC)

EMC Reports and subjects dealt with.

1. Report June 1992

This report dealt with seven different EMC matters: Fluorescent lamp radiation, Underground testing facility, BT telephones, Radiation from Early-Warning-System, EMC statistics UK,

Passive infra-red sensors,

Cable TV on Channel 6 and EMC in Germany.

2. Report October 1992

New law on amateur radio in Germany. The Minister, who stated at the Friedrichshafen International Amateur Meeting that "Amateur radio may have to live with 'QR-QRPP'" has now been replaced!

Wind profilers in the USA. Susceptible Alarm Systems and telephones.

3. Report January and February 1993

This summary report titled "Amateur Radio and Electromagnetic Compatibility" Parts 1 and 2 had been submitted on 23.1.1992, but the publication had to wait until there was enough space in "AR". This delay did not do any harm, because this report was summing up EMC problems and remedies which had already been published in "AR" several years ago in a number of "AR" issues. This summary was compiled for those readers who did not keep earlier "AR"s or who joined our ranks more recently.

4. Report submitted 17/12/1992

Telephone susceptibility in the USA. Powerline rf interference sniffer and power authority, European-Common-Market and EMC-Standards. Even watered down standards (compared with the German 3Vm immunity requirement) for TV, VCR, Computer and HiFi-gear, seem to be beneficial in this country, because my nearest neighbours and my own new TV set have sufficient and improved immunity, compared with our earlier owned TV-sets. If manufacturers wish to supply 300 or so millions of people of the EEC - and they cannot afford not to try so - they have to meet certain EMC standards, and we in VK-land hope to benefit as well from this development if we receive the same imported goods.

4.2. A "Research -Association-Radio" has been formed in Germany, comprising experts from science, commerce, government, radio-amateurs, the media, on rf-radiation and its influence on humans (if any), to counter the nonsense now sometimes published.

My own experience: the Electronic Component-Lab of the Rosenthal Insulator Co Ltd in northern Bavaria/Selb, of which I was in charge for 7 years (prior to my coming to VK2), was attached to the High-Voltage-Lab. This lab operated a 2.3 million volt DC pulse generator, and a 1.2 million volt 25 or 50 Hz motorgenerator and transformer. The sparks, of up to 8 m in length through an artificial rain curtain, were most spectacular, shaking the building as well. Not far away was the testbed for about 100 plate insulators running 110 kV. Nobody, female or male employees suffered any ill effects, nor the families who lived 50 m away, like mine, and most company directors.

Hans F Ruckert VK2AUO
Federal EMC Co-ordinator

WIA EXAM SERVICE

WIA Exam Service operated successfully during its first full calendar year of operation and received many plaudits from examiners and candidates.

The statistics for 1992 were:

Accredited Examiners registered at 31st December	438
Examination events conducted during the year	515
Candidates who sat for exams	2383
Average exam pass rate	53.68%
Average candidates sitting at each event	4.63
Average exam subjects sat at each event	7.81

Because exams were costed on the basis of a minimum of 20 exam subjects at each event, and the average was a low 7.81, the WIA had to reluctantly increase the cost of exams as from 1st October 1992. This increase appears to have had no effect on the number of candidates sitting for examinations, and has reassured the financial viability of the service being offered by the WIA to amateur examination candidates all over Australia, regardless of location.

Several instances of exam irregularities are being investigated by the DoTC and seven examiners have been suspended pending the outcome of the investigations.

Work is continuing on increasing the theory question banks to 1000 questions each, at which time, hopefully before 31st December 1993, the complete theory question banks will be published for the information of course instructors and candidates.

Bill Roper, VK3ARZ
General Manager & Secretary

WARC AND CCIR

Since WARC-92, which was reported on last year, there has been continuing activity on the ITU-CCIR front. This activity will have definite ramifications for the amateur service. There is the continuing issue of the restructuring of the ITU. In addition a number of special CCIR TASK GROUPS have been set up to deal with matters arising out of Resolutions and Recommendations carried at WARC-92. Several have a direct bearing on amateur frequencies.

RESTRUCTURING OF THE ITU

I will firstly deal with the restructuring of the ITU. At its Nice Plenipotentiary meeting the ITU set up a HIGH LEVEL COMMITTEE to recommend, on the basis of an in-depth review of the structure and functioning of the Union, measures to enable the ITU to respond effectively to the challenges of the changing telecommunication environment.

To this end the report of this Committee was published in April 1991 with 96 recommendations. The most significant were those concerned with the International Frequency Registration Board (IFRB), International Radio Consultative Committee (CCIR), the International Telegraph and Telephone Consultative Committee (CCITT) and the Bureaux of Telecommunications Development (BDT).

It was proposed that the IFRB be disbanded and its function be combined with the CCIR to form the RADIO COMMUNICATIONS SECTOR with a nine person part time RADIOCOMMUNICATIONS BOARD and a full time Director. The CCITT would become the Standardisation Sector which would also take over some of the standardisation work of the CCIR. Also a third sector involving the BDT the DEVELOPMENTAL SECTOR would be formed.

The amateur and amateur satellite service is to be covered by the RADIO COMMUNICATIONS SECTOR however there may be some matters covered by the Standardisation Sector that could have an effect on the amateur service.

ADDITIONAL PLENIPOTENTIARY CONFERENCE

Acting on the recommendations of the HLC a draft new Constitution and Convention for the ITU was produced, to be presented at the ADDITIONAL PLENIPOTENTIARY CONFERENCE for consideration.

In this draft there was one change from the old Convention of great significance to the IARU, which the IARU, as the International Organisation representing the amateur service, thought could have been made by an oversight. This change removed the ability of the Council of the ITU to exempt International Organisations from having to financially contribute to the ITU if participating in the Technical committee of a WRC (equivalent of the CCIR). This would have cost the IARU an extra \$40,000 per year to do what it is presently doing with out cost.

As a member of the Australian Preparatory Group for the Additional Plenipotentiary Conference which was to agree to the new constitution and convention I obtained support from Australia for revision to the original provisions of the convention.

This was accepted by the APP along with a number of other changes to the draft.

WORLD RADIO CONFERENCES

World Administrative Radio Conferences (WARC) now become World Radio Conferences (WRC). These Conferences will be held every two years, with the agenda set four years ahead. There is the provision for skipping a conference if it is thought necessary.

The regular nature of these conferences will throw a constant load on the representatives of the amateur service. The IARU is aware of this and is currently

working on a strategy involving continuous vigilance to make the best use of our resources.

The CCIR work will continue through Radio Communications Study Groups and Radiocommunications assemblies which will be held every two years.

The significance of these changes to the WIA is in our need to continue our involvement with the Australian Administrations work in the preparation for International Conferences. Also to continue to be a member of the appropriate CCIR Study Group.

Currently there is the ongoing involvement with Australian CCIR Study Group 8 and more particularly Australian Study Group 8/L which has on its agenda the amateur and amateur satellite services.

Internationally, Working Party 8/A of the CCIR deals with the Amateur and Amateur Satellite Service its question and the various reports arising.

Also of concern to the amateur service are two CCIR Task Groups firstly TG 8/2 looking at Wind Profiler Radars which could involve frequencies around 50 MHz and 450 MHz. And secondly TG 12/4 which is studying inter-service sharing between 1 and 3 GHz. Bearing in mind the results and resolutions of WARC-92.

I will be attending TG 12/4 on behalf of the IARU.

With the proposed introduction of new services in the UHF bands at WARC-92 extreme pressure has been put on the existing services including the amateur service and also the amateur satellite service.

Adequate representation at the appropriate CCIR meetings will be essential to put the position of the amateur services, as the unique nature of the service is not always appreciated by all other delegates.

The matter of harmonisation of the frequencies around 7 MHz will be on the agenda for a future conference.

VOLUNTEER GROUP OF EXPERTS (VGE)

This group has been set the task of simplifying the ITU Radio Regulations. Discussions have taken place with the Australian representative on this group.

A matter of concern is the apparent invisibility of the amateur satellite service in the International Frequency Table in the bands between 144 MHz and 10 GHz. This is due to the fact that the amateur satellite service is there by virtue of a footnote to the Frequency Table No. 66A which appears in association with the 430-440 MHz band.

As the text of the footnote only appears once, it leads to difficulties in easily identifying the actual bands on which amateur satellite operation is allowed. It would be much more satisfactory if the Amateur satellite service actually appeared in the table.

IN CONCLUSION I RECOMMEND

- 1: That the WIA's involvement with WARC (ITU Regulatory Conferences) matters and the CCIR should be maintained as an important factor in the defence of amateur radio
- 2: That the title be changed to International Regulatory and CCIR Coordinator. In the Future the

CCIR may need to be changed to Radiocommunication Study Group

David Wardlaw VK3ADW
WARC & CCIR Co-ordinator

REPORT OF THE INTERNATIONAL TRAVEL HOST EXCHANGE (ITHE)

The International Travel Host Exchange (ITHE) is a voluntary scheme administered by the American Radio Relay League (ARRL) whereby interested radio amateurs are able to meet or host fellow operators from other countries. This is a free service, which is promoted by the WIA to its members. You do not have to be on the list to contact those on it.

During 1992 only three enquiries were handled by this office, one by a local intending to travel overseas, and two by potential visitors. A visiting US amateur spent six months in this local area and another seemed to have planned his visit around ITHE participants all over Australia! There have been a few other direct contacts between participants.

The total Australian membership is 23 couples or individuals and we need some more names. Please send an SASE to the undersigned for more details: Ash Nallawalla VK3CIT
PO Box 539,
Werribee VIC 3030
(03) 741-9302 AH; (03) 742-4566 Fax

Ash Nallawalla VK3CIT
Federal ITHE Co-ordinator

ALARA REPORT

Throughout the year the Editor has maintained a high standard of production of the Newsletter, and using modern computer technology has improved and changed the layout of the Newsletter introducing photographs, adding to the overall appearance. Changes to the committee have been the Editor, now Dorothy VK2DBB, and the Publicity Officer, Robyn VK3ENX.

Various members assisted scouts and guides for JOTA and enjoyed it.

The ALARA Contest had the highest number of logs submitted for a number of years, good conditions no doubt being helpful. Club stations were permitted to participate on a trial basis. The Florence McKenzie trophy was not won.

The method of mailing the Newsletter was changed from Registered Publication to ordinary letter mailing.

As several of our members now operate on Packet that system was used to publicise the ALARAMEET to be held in 1993.

One of our VK4 members worked the Shuttle. VK4 members have commenced a weekly net and the official ALARA net continues on a Monday night to provide a first contact and for friendly continuing contacts.

Bron Brown, VK3DVF
Secretary



I talk to the world on Ham Radio

THESE BUMPER STICKERS ARE NOW AVAILABLE. FOR ORDERING, PLEASE REFER TO THE "WIA DIVISIONAL BOOKSHOPS" LISTING ON THE INSIDE BACK COVER.

HAMADS

TRADE ADS

- AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/prices to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanya Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Truscotts Electronic World, Melbourne.

- WEATHER FAX programs for IBM XT/ATs
*** "RADFAX2" \$35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder.

- *** "SATFAX" \$45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHERFAX PC card, + 137 MHz Receiver.

- *** "MAXISAT" \$75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.5 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3-00 postage.

ONLY from M Delahunt, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE ACT

- YAESU FT227RB 2m xcvr, 10w, scanning memoriser, mic, FL2050 2m linear amp incl rx preamp, manuals, \$300; YAESU FT 707 xcvr, 100w, WARC, digital freq, FP107E 240vac/13.5vdc PSU, \$700; Ron VK1WP (062) 54 9842, lic amateurs only.

FOR SALE NSW

- COLLINS KWM2A, COLL INV 11 yrs, brand new SH125, 10w, DIAMON, 0w du ~~SOLD~~ ^{years in quite sup} ~~\$2000~~ ^{\$2000}; Charles VK1VK, (02) 665 4767.

- YAESU FT107M S/N 1H100145 fully featured all SS base station, memory system fitted, built-in AC PSU, WARC bands, hand and desk mic, \$800; VK2BJI QTHR (068) 62 2154.

- YAESU FTDX400 S/N 9052109, spare valves, spkr, \$320; Valves 6146, 12BY7, 833A, 832A, CQE600, 2C39, 809, 807, 811, 816, 6AG7, 4-125A, 4CX250B, 5763, 803, 6AQ5, 6AU6 plus lots more; Bob VK2ZHS QTHR (02) 567 5390.

- TOWER 15m galv 3 sect tilt-over HD, remote powered up/down from shack, HYGAIN TH4 triband beam, HAMILL rotator control, BN86 Balun, location Sydney, purchase to dismantle and remove, urgent sale, \$1300; Dennis VK2AEQ QTHR (042) 84 4403.

- KENWOOD TS520S xcvr, orig cond, spare xtals, orig packing and invoices, \$500; YAESU FT200, exc cond, spare xtals, orig pkgs etc, \$150; MICRONTA Power SWR tester, unused, \$30; OSKER Block SWR 200, \$80, or \$700 the lot; Barry VK2MFT (066) 42 3936.

- AMSTRAD 6128 CP/M computer, green screen mon with 3" FDD, Word Star W/P,

games, data base and graphics programs, manuals, \$200 ONO; VK2ENU QTHR (046) 26 4776 7pm-9pm.

- TET Minibeam Yagi 5m span, 2 el, 14/21/28, complete incl docs, some adjustment needed, \$100; VK2FFA (043) 24 4160.

FOR SALE VIC

- MASPRO new Yagi 10 el 144 MHz \$125; 14 el 430 MHz \$100; ARAKI power divider 144 MHz \$110; 430 MHz \$100; KINGROTOR rotator, 100m cables \$300; 10DFB cable and "N" conn 30m, \$300; DECIBEL 144 MHz cavity filter \$350; YAESU FT 747GX S/N 3L020338 exc cond, MH-1B8 mic, manual \$995; YAESU FT209N S/N 4N100794, FT-6 tone squelch, MH-12A2B sp/mic, NBN-3 Nicad pack, YH2 for hands free, carry case, tech manual, \$395; Victor (03) 480 4137.

- DECEASED ESTATE — YAESU FT102 HF all mode xcvr, YAESU YD148 mic, manual; YAESU FT77 HF xcvr, mic, manual; YAESU FP700 PSU, manual; ICOM IC22 VHF FM xcvr, mic, manual; 2V POWER MATE 13.8vdc, 5A PSUs; YAESU FT230R 2m FM xcvr, mic, pre-amp, fan, manual; EMTRON antenna tuner EAT300; SWR/POWER meters, model 171; WELZ SP420 144-525 MHz, OSKER BLOCK SWR200; 2m RINGO antenna; WERNER WULF 6 el beam, 10 & 15m duobander; IWOSAKI antenna rotator, 26vac control box type 0500, 6 core cable, 40mm OD aluminium tubing 3m long; DSE high power VHF linear amp K6313 138v 20a; contact Tom VK3AGH QTHR (03) 379 3315.

- WIND MILL tower, 50ft, to be removed, \$100; Ted VK3TG (052) 59 3225.

FOR SALE QLD

- GOLDSTAR CRO model OS7020 20 MHz, new cond, no further use, \$500; YAESU FT201 SSB tcr 80m to 10m, needs new LSB xtal, S/N 4M303198, \$150 ONO, (amateurs only); Gordon VK4KAL QTHR (079) 85 4168.

- KENWOOD xcvr TS1205 S/N 0020641, KENWOOD AT130 ant tuner (new), KENWOOD HS4 headphones (new), \$600 the lot; Jim VK4OK phone Booval (072) 81 8776.
- SWAN 700 CX xcvr 700w PEP, special SS16B sideband model, mint cond, spare pair 8950 finals (new), \$750; TENTEC CENTURY 21 QSK CW xcvr, exc cond, \$370; both have instruction manuals; Don VK5HP4 (076) 61 6200 (bus) (076) 85 2167 (ah).

- BIRD 43 pwr meter, good cond, no inserts, \$350; BIRD 43, leather case, inserts 5D and 5B, \$650; VK4DY (074) 96 1186.

FOR SALE SA

- RCA comm rx AR88, LF 73 kHz to 30 MHz with books, in fine wkg cond, circa 1940, collectors piece, best offer; VK5QJ, 7 Hewitt Ave, St Georges SA 5064.

FOR SALE TAS

- WELZ CH20A 2 pos quality coax switch (two) for UHF conn, VGC, info leaflet, \$35 ea; KENWOOD RD-20 RF dummy load, 50 ohms, 20w for VHF/UHF, GC, \$20; Frank VK7LO, QTHR, (004) 33 3231.
- KENWOOD TS520S, exc cond, incl MC50 base mic, new finals, \$550 ONO; MFJ ACTIVE ANT \$80; ICOM SP7 and SP3 ext spkrs, new; VK7AN (003) 27 1171.

WANTED NSW

- EXT SPEAKER ICOM SP20 or similar, Peter VK2FFA (043) 24 4160.

WANTED VIC

- 12 volt 20-25 Amp PSU, good cond, John (03) 714 8612 after 6.00 pm.
- MOBILE 432 MHz xcr or duo bander in top cond, prefer late model. Pay good price for right rig; Max VK3YBE (059) 85 2671.
- YAESU YM24A speaker/mic in good cond; Jack VK3EB QTHR (03) 882 1769.
- VZ300 computer hardware, colour printer/plotter TOYO type TR 40 or equiv; RTTY module and software; Modern unit; Serial to Parallel interface; Bruce VK3YBW QTHR (03) 527 2661 after 6pm.
- MANUAL and/or CCT for HEATHKIT reg PSU Model IP-20, will re-imburse costs, VK3AEX QTHR (053) 32 3273.
- DOMESTIC OR COMMERCIAL SATELLITE rx, must incl cct diag and op handbook, reqd good wkg order, complete ground station preferable, 1 GHz band in/ UHF TV IF out; Vincent VK3AO QTHR (03) 872 3503.

WANTED QLD

- HELP! any info xcvr 50w AirForce made in USA 30RT 749 ARC-109, 115v 5821-900-4006 Ser No 0000 233 F33657-67-C-0605 2B-4304-001, Call Trevor VK4ARB QTHR (07) 269 8848.

WANTED TAS

- COMMUNICATIONS software for Amiga 500, AMTOR, RTTY, PACKET; Mike VK7ME (004) 38 1217.

MISCELLANEOUS

- PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

- 1993 URUNGA RADIO CONVENTION Easter 10-11 April, Australia's finest for hunting events. Trading, tables, disposals, quizzes, competitions, free tea, coffee, TV, Lounge, hall, amenities under one roof, no steps. Children welcome. Terrific climate 21-24 deg C 44th Anniversary: VK2ADA, VK2DGT, VK2DMS.

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100kHz — 30 MHz multimode
Sync detector, twin VFO
Five filter bandwidths
Optional speaker and
VHF converter

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NF — 60 DSP notch filter
NIR — 10 noise/interference
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20 Scenic Cres

Eltham North VIC 3095

Tel: (03) 439 3389

Fax: (03) 439 2483

*Bankcard — Visa —
Mastercard*

Morseword 73

Solution Page 56

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© Audrey Ryan 1992

Across:

1. Taxi
2. Heat up
3. Twist
4. Competes
5. Facsimile
6. Substance
7. Sth African currency
8. Baulk
9. Curtsey
10. Urn

Down:

1. Mediterranean island
2. London hotel
3. Aged
4. Begin
5. Pond
6. Young
7. Katherine
8. Grandmother
9. Disaster
10. Pen

Hamads

Please Note: If you are advertising Items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address

Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300.

Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: \$25.00 for four lines, plus \$2.25 per line (or part thereof) Minimum charge — \$25.00 pre-payable.

State:

Not for publication:

Miscellaneous

For Sale

Wanted

Name: Call Sign: Address:

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:

Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:

R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. \$4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

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Solution to Morseword No 73

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5	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-

Solution to Morseword 73

Across: 1 Cab; 2 Warm; 3 Kink; 4 Vies; 5 Fax; 6 Matter; 7 Rand; 8 Jib; 9 Bow; 10 Vase.
Down: 1 Crete; 2 Ritz; 3 Old; 4 Star; 5 Lake; 6 Katy; 7 Gran; 8 Idle; 9 Ruin; 10 Write.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
 (see the WIA Division Directory on page 3 for the address of your Division)

Ref	List Price	Ref	List Price
ANTENNAS			
Ant. Compendium Vol 1 Software 5.25" IBM Disk	\$99.00	Morse Code — The Essential Language	\$10.00
Antenna Compendium Vol 2 — RSGB	\$44.00	Morse Code for Radio Amateurs — RSGB	\$16.00
Antenna Compendium Vol 1 — ARRL	\$163.00	Morse Code Tapes Set 1: 5-12 WPM — ARRL	\$18.50
Antenna Compendium Vol 2 — ARRL	\$24.00	Morse Code Tapes Set 2: 15-22 WPM — ARRL	\$18.50
Antenna Impedance Matching — ARRL	\$25.00	Morse Code Tapes Set 3: 13-14 WPM — ARRL	\$18.50
Antenna Impedance Matching — ARRL	\$17.00	Morse Code Tapes Set 4: 13-14 WPM — ARRL	\$18.50
Antenna Pattern Worksheets Pkt of 10	\$32.00	Morse Tutor 3.5" IBM Disk	\$20.00
Antennas 2nd Ed John Kraus — 1998	\$25.00	Morse Tutor 5.25" IBM Disk	\$20.00
Easy Up Antennas	\$104.25	OPERATING	
G-QRP Antenna Handbook	\$104.25	Amateur Radio Awards Book — RSGB	\$20.00
Handbook of Radio Engineering — DeLaval WHFR — ARRL	\$163.00	Amateur Techniques — G3XRA — RSGB	\$36.00
Physical Design of "Yagi" — 3.5" IBM Disk	\$26.00	DXCC Companion — How to Work Your First 100	\$12.00
Physical Design of "Yagi" — 3.5" Mac Disk Excel Format	\$26.00	DXCC Country Listing — ARRL	\$5.00
Physical Design of Yagi 5.25" IBM Disk	\$26.00	FCC Part 97 Rules — A Guide for the FCC Regulations	\$10.00
Physical Design of Yagi 5.25" IBM Disk	\$26.00	Location of Exports — RSGB	\$6.00
Practical Antennas Handbook — Tab	\$49.00	Log Book — ARRL — 9" x 11" Wire Bound	\$7.00
Practical Antennas Handbook — Tab	\$49.00	Log Band DXing — John Devoldere	\$18.00
Practical Wire Antennas — RSGB	\$28.00	Operating Manual — ARRL — 4th Edition	\$36.00
Reflections — Software 5 inch disk	\$26.00	Operating Rules — ARRL	\$10.00
Reflections — Transmission Lines and Antennas — 5.25" IBM	\$26.00	Passport to World Band Radio	\$34.00
Reflections — Transmission Lines and Antennas — ARRL	\$26.00	Prefix Map of North America	\$8.00
Reflections — Transmission Lines and Antennas — ARRL	\$26.00	Prefix Map of the World — RSGB (abbreviated)	\$20.00
Simple Low Cost Wire Antennas	\$25.50	RTTY — The Art and Science of Digital Radioteletype	\$10.00
Smith Chart Expanded Scale PK of 10	\$6.50	Short Wave Propagation Handbook	\$18.00
Smith Charts Scales & BET co-implants Pack of 10	\$10.00	The Complete DXer — W9KNI	\$20.00
Smith Charts Scales & Covert PK of 10	\$10.00	Transmitter Hunting	\$22.00
The Antenna Handbook — ARRL 1997 edition	\$46.00	World Grid Locator Atlas — (Maidenhed Locator) — ARRL	\$10.00
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